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ISBN 0-620-37192-7

# Annual Report 2005/06

Promoting Excellence in Science for Society



PHYSICAL & EARTH SCIENCES



*to be or not to be*



HUMANITIES

LIFE SCIENCES



*health*

*the bear*



ECONOMIC SCIENCES

TECHNOLOGICAL SCIENCES



*able development*

*auguste comte*



SOCIAL SCIENCES

MATHEMATICAL SCIENCES



*fibonacci*

reading writing arithmetic



EDUCATION

planting and reaping



AGRICULTURAL SCIENCES

# Preamble to the Constitution of the Academy of Science of South Africa 1996

SCIENTIFIC THOUGHT AND ACTIVITY ENRICH US PROFOUNDLY; they empower us to understand and to shape our living environment; they are keys that can open doors to a peaceful and prosperous future. The function of science is to create in a disciplined and systematic way a continuum of coherent, rational and universally valid insights into observable reality in all its various facets. Scientific thinking and knowledge are fundamental to the best work done in the applied natural sciences and in technology, and this applies also to much of the human and social sciences.

An academy that effectively harnesses the minds and energies of the most able practitioners of scientific thought, reflects, as almost nothing else does, the strong bonds between scientific disciplines and the unique character of the scientific contribution to the lives of all citizens. The Academy of Science of South Africa is constituted to ensure that leading scientists, acting in concert and across all disciplines, can promote the advancement of science and technology, can provide effective advice and can facilitate appropriate action in relation to the collective needs, threats, opportunities, and challenges of all South Africans.



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■ **Robin M. Crewe** President

## Message from the president

THERE ARE PERIODS IN THE LIFE OF INSTITUTIONS such as the Academy during which much of the preparatory work of the past leads to a seismic shift in its role and impact. The past year has seen such developments for our Academy based largely on the establishment and consolidation of a well functioning secretariat that is admirably led by our chief executive officer, Prof. Wieland Gevers and the team that has been assembled to support our burgeoning activities.

In the preface to the previous year's annual report, I noted the following:

“The primary challenge for the new council is to establish the Academy as the preferred source for evidence based advice on issues of national concern. In this regard, the developing collaboration with National Academies of Science in the USA should provide the means of achieving this goal in a shorter space of time than would have been the case without their assistance.”

The work that is discussed in this expanded annual report makes clear that this challenge has been accepted and addressed in ways that are having a significant impact in defining the role of the Academy and demonstrating its impact on public policy. The highlights in the realm of offering evidence based advice, have been the publication of the comprehensive report on “A Strategic Approach to Research Publishing in South Africa”, and the holding of a double symposium to consider ‘Evidence-based practice: problems, possibilities and politics.’ The report on research publishing received significant media attention both locally and internationally and is the subject of discussions with two government departments.

The Academy has developed policies and guidelines for its activities as they have become necessary. The initiation of the African Science Academies Development Initiative (ASADI) partnership with the US National Academies prompted the generation, proposal and adoption of guidelines for proposals of science-based topics in terms of the ASSAf Act, of guidelines for proposals of science-based topics (project proposals), of guidelines for the appointment of Study Panels and Forum Steering Committees, a policy on support for Conferences, the formation of a “Committee on Science for the Alleviation of Poverty,” and a brief for the Consensus Study on “Nutritional Influences on Human Immunity, with



## *An engine of excellence in scholarship and intellectual cooperation*

special reference to clinical tuberculosis and HIV infection”.

The international activities of the Academy have expanded considerably, not only as a result of the engagement with the ASADI partnership, but also because the Academy is increasingly being involved in developing bilateral and multilateral relationships with other Academies. In the future, it is clear that the Academy will need to develop the capacity to maintain and enhance these relationships.

During the course of the year, the contract with Dr Hennie Smith, who had served as the first administrator of the Academy, came to an end. The council and the members of the Academy thanked Dr Smith for the very significant contribution that he had made to the Academy in its formative stages.

The Strategic Plan that is attached to this report gives a clear indication of the ambitions that the Academy has for the future. These ambitions will only be realized by the continued substantial involvement of the membership of the Academy in these activities. Furthermore, we are grateful to the Department of Science and Technology and the African Science Academies Development Initiative for providing the Academy with the resources to achieve its objectives.

**Robin M. Crewe**

President

August 2006

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of the Academy have  
expanded considerably.*

*The Academy of Science of South Africa places a particular emphasis on excellence in the application of scientific thinking to the problems and challenges facing the South African society.*

# Introduction

## The science academy ideal

INTERNATIONALLY recognised science academies are similar in that they are

- **self-perpetuating**, with a merit-based membership that creates an upward aspiration for quality and excellence in scientific endeavours;
- **multidisciplinary**, striving to represent science as a consilient continuum of knowledge, insight and practical solutions;
- **independent** of government, but can be funded by government for performing certain tasks;
- a **credible voice of science** to be heard on topics of national concern, independent of institutional or commercial linkages, obligations and agendas; and
- linked together in an **independent global community** that can mobilise scientific thinking, skills and knowledge across the world.

The Academy of Science of South Africa places a particular emphasis on **excellence in the application of scientific thinking to the problems and challenges facing the South African society**. It draws its membership from all population groups and from all scientific disciplines.

*The Academy of Science of South Africa is constituted to ensure that leading scientists, acting in concert and across disciplines can promote the advancement of the application of Science to the problems and challenges facing South Africa*



# The Academy of Science of South Africa Act (2001)

A statutory body placed strategically in the National System of Innovation

THE ACADEMY OF SCIENCE of South Africa (ASSAf) was inaugurated in May 1996 in the presence of **then President Nelson Mandela, the Patron of the launch of the Academy**. It was formed in response to the need for an Academy of Science consonant with the dawn of democracy in South Africa: activist in its mission of using science for the benefit of society, with a mandate encompassing all fields of scientific enquiry in a seamless way, and including in its ranks the full diversity of South Africa's distinguished scientists.

The Parliament of South Africa subsequently passed the **Academy of Science of South Africa Act, Act 67 of 2001**, which came into operation on 15 May 2002.

**ASSAf is thus the official national Academy of Science of South Africa, recognised by Government and representing South Africa in the international community of science academies.**

*Scientific thinking for the good of society*

*ASSAf is thus the official national Academy of Science of South Africa, recognised by Government and representing South Africa in the international community of science academies.*



Image: Quest – Science for South Africa

# Objectives

## Scientific thinking for the good of society

ACCORDING TO THE ACT the **objectives of the Academy** are

- to promote common ground in scientific thinking across all disciplines, for example the physical, mathematical, life, human, social and economic sciences;
- to encourage and promote innovative and independent scientific thinking;
- to promote the optimum development of the intellectual capacity of all people;
- to provide effective advice and facilitate appropriate action in relation to the collective needs, opportunities and challenges of all South Africans; and
- to link South Africa with scientific communities at the highest levels, in particular within Africa, and further afield.

# Vision

## An engine of excellence in scholarship and intellectual cooperation

THE ACADEMY OF SCIENCE of South Africa aspires to be the apex organisation for science and scholarship in South Africa, internationally respected and connected, its membership simultaneously the aspiration of the country's most active scholars in all fields of scientific enquiry, and the collective resource making possible the professionally managed generation of evidence-based solutions to national problems.

*The Academy of Science of South Africa aspires to be the apex organisation for science and scholarship in South Africa.*



# Mission statement

## Clarifying the niche of the Academy

NATIONAL SCIENCE academies are assuming increasing importance in the world science system, both as unique and potentially valuable entities in their respective national systems of innovation and science-based development generally, and in regional or other supra-national configurations, up to the global body called the InterAcademy Panel (IAP), with its dedicated subsidiary unit (the InterAcademy Council, or IAC), generating evidence-based reports and recommendations for the global community of nations. Many national science academies are also the adhering bodies of the International Council on Science (ICSU), promoting individual disciplines worldwide, and organising international cooperation in large-scale, global projects.

Like democratic South Africa in general, ASSAf aspires to play both a national and an international role, particularly with respect to the African continent. We see the Academy as usefully at arms length from Government and other organised sections of the state, comprising an assembly of excellent scholars from many disciplines who are well-networked both nationally and internationally, and have shown their interest in and capacity for promoting the development of a prosperous and a fully enabled society. Membership of the Academy (by election) is both an honour and an obligation to work individually and collectively (as the Academy) to ensure that decision making requiring scholarly scrutiny and analysis is based on the best and most integrated understandings and insights available to the country. The Academicians thus represent an organised, independent but responsive scholarly voice to help guide the development of the country and its people.

**The Mission of ASSAf** is thus to

- become increasingly associated in the mind of the nation with the highest levels of scholarly achievement and excellence in the application of scientific thinking for the benefit of society;
- consolidate its infrastructure and capacity, and to expand and mobilise the membership to ensure that scholars from a full disciplinary spectrum are available for its work, and that these are indeed both thinkers and doers, willing to put significant effort into the Academy's activities;
- embark on a programme of systematic studies of evidence-based issues of national importance, some

*National science academies are assuming increasing importance in the world science system, both as unique and potentially valuable entities in their respective national systems of innovation and science-based development generally, and in regional or other supra-national configurations, up to the global body called the InterAcademy Panel (IAP), with its dedicated subsidiary unit (the InterAcademy Council, or IAC), generating evidence-based reports and recommendations for the global community of nations.*

## Member of an international community of academies



Image: Quest – Science for South Africa

- proposed by government or other sectors, and some identified by the Academy itself;
- develop a sound and robust methodology for constituting study panels, organising their work, including conferences and workshops, and producing authoritative reports that are well-disseminated and have significant impact;
- publish science-focused periodicals, especially a multi-disciplinary journal of high quality (the *South African Journal of Science*) and a science magazine that will showcase the best of South African research to a wide national (and international) audience (*Quest – Science for South Africa*), and to promote the development in South Africa of an indigenous system of research journals of internationally recognised quality and usefulness;
- develop productive partnerships with other organisations, especially (but not only) the Departments of Science and Technology, Education, Health and Agriculture; the National Advisory Council on Innovation; science councils; higher education institutions, etc., with a view to the building of capacity in science and its applications within the National System of Innovation (NSI);
- create new and diversified sources of funding for the sustainable functioning of an independent Academy;
- communicate effectively with the general and specific publics, as well as with partners and sponsors;
- develop a plan for the expansion of the activities of ASSAf in partnership with the national science academies of other countries, including contracted partnership with the US National Academies; and
- play a significant role in the international science system, particularly in Africa, through organisations such as the InterAcademy Panel (IAP) and the InterAcademy Council (IAC), the Academy of Sciences of the Developing World (TWAS), the International Council on Science (ICSU), as well as the Network of African Science Academies (NASAC), all in the context of the New Partnership for Africa's Development (NEPAD).



# Programme 1

## Administration and internal activities

### Governance

#### The critical role of the Council

According to the Constitution of the Academy, members of Council, all of whom are also members of ASSAf (MASSAf) are elected for a two-year term. The Council meets five times during the year, and consisted during 2005-6 of the following members, each serving a two-year term that will end in October 2006:

- |  |   |
|--|---|
| ■ <b>Prof Robin Crewe</b> President          | ■ <b>Prof Anusuya Chinsamy-Turan</b> Vice-President |
| ■ <b>Prof Jonathan Jansen</b> Vice-President | ■ <b>Dr Philemon Mjwara</b> General Secretary       |
| ■ <b>Prof Vivian de Klerk</b> Treasurer      | ■ <b>Prof Solomon Benatar</b>                       |
| ■ <b>Prof Manfred Hellberg</b>               | ■ <b>Prof Colin Johnson</b>                         |
| ■ <b>Prof Benito Khotseng</b>                | ■ <b>Prof Chabani Manganyi</b>                      |
| ■ <b>Prof Luigi Nassimbeni</b>               | ■ <b>Prof James Volmink</b>                         |
| ■ <b>Prof Jennifer Thomson*</b>              |   |

\* As required by the Act, Prof Jennifer Thomson was appointed to the Council by the Minister of Science and Technology as the representative from the National Advisory Council on Innovation (NACI).

The minutes of all Council meetings are circulated to all members of the Academy, and the Council frequently consults the full membership on key issues of policy or action. No public statement is released unless all members have had the opportunity of making their views known on its contents in draft form.

*No public statement is released unless all members have had the opportunity of making their views known on its contents in draft form.*

## Members of Council



**Prof Robin Crewe**  
President



**Prof Anusuya Chinsamy-Turan**  
Vice-President



**Prof Jonathan Jansen**  
Vice-President



**Dr Philemon Mjwara**  
General Secretary



**Prof Colin Johnson**



**Prof Benito Khotseng**



**Prof Chabani Manganyi**



**Prof Luigi Nassimbeni**



*An engine of excellence in scholarship  
and intellectual cooperation*



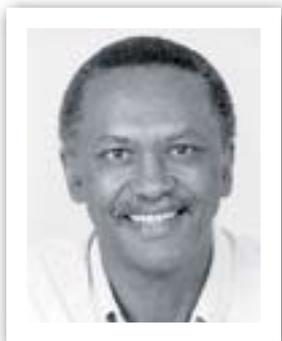
**Prof Vivian de Klerk**  
Treasurer



**Prof Manfred Hellberg**



**Prof Solomon Benatar**



**Prof James Volmink**



**Prof Jennifer Thomson**



**Prof Wieland Gevers**  
ASSAf Executive Officer

*Care is taken to involve all members in the activities of the Academy. Members are kept informed of developments through circulars, a quarterly Members' Newsletter, and the minutes of Council meetings. Members are also involved in the election of Council, in the formation of Study Panels and Steering Committees for science-based advice functions of the Academy, in the election of new members, and in nominating awardees. They also have the opportunity of direct representation at the AGM.*

## The members (MASSAf) – core asset of the Academy

A FURTHER ROUND of nominating and electing new members by all existing members was conducted during August and September 2005. Thirty new members were added to the ranks, while four members resigned for reasons of ill-health or permanent foreign residence. The total membership now stands at 261.

The demographic and (self-categorised) disciplinary composition of the ASSAf membership is shown in the following table:

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	Male	Female	White	Black	Total
<b>Earth Sciences</b>	8	2	8	2	<b>10</b>
<b>Economic Sciences</b>	8	2	5	5	<b>10</b>
<b>Humanities</b>	34	16	32	18	<b>50</b>
<b>Life Sciences</b>	56	13	51	18	<b>69</b>
<b>Mathematical Sciences</b>	13	1	9	5	<b>14</b>
<b>Physical Sciences</b>	33	3	27	9	<b>36</b>
<b>Social Sciences</b>	25	11	22	14	<b>36</b>
<b>Technological Sciences</b>	25	5	26	4	<b>30</b>
<b>Education</b>	4	1	2	3	<b>5</b>
<b>Agricultural Sciences</b>	1	0	1	0	<b>1</b>
<b>TOTAL</b>	<b>207</b>	<b>54</b>	<b>183</b>	<b>78</b>	<b>261</b>



## ASSAf infrastructure and personnel policies and practice

### ASSAf's Resource Centre

The Academy's activity has increased dramatically since the initiation of its partnership with the United States National Academies, enabling ASSAf to employ projects officers and to handle projects making many demands for background analysis and information gathering. While many of these can be met by Internet-based searches, there is still a need for a resource centre containing resource books, current annual reports of South African agencies in the science domain, and other types of reference materials. ASSAf has negotiated that it may use the extensive library and resource centre of the Africa Institute of South Africa (AISA) in Pretoria as back-up for its own resources. ASSAf staff also have access to big academic libraries at the nearby universities of Pretoria and UNISA (the University of South Africa).

The resource centre so far consists of three sections, with more shelving to be added in the future. Each section has its own focus, namely

- publications and reference materials published by ASSAf;
- documentation from South African Government departments, agencies and institutions in the Science and Technology domain; and
- reports and other publications from partner science academies and international academy-type organisations such as TWAS, the IAP, IAC and ICSU.

ASSAf's extensive distribution list for its own reports and publications includes inter alia Government departments and private sector corporations, universities, science councils and other Academies, which are routinely requested to reciprocate by regularly supplying ASSAf with their own publications.

### ASSAf's recruitment and remuneration policy, and infrastructure development

The Academy has a financial and human resources service contract with the National Resource Foundation (NRF), the largest and best-established research grant-making institution in the country, and its human resource policies are adopted from or strongly aligned with NRF policies in this area.

*The resource centre so far consists of three sections, with more shelving to be added in the future. Each section has its own focus.*



## *Scientific thinking for the good of society*



The Academy strives in the recruitment of staff to pursue a comprehensive and fair selection process, with due regard to its empowerment and employment equity strategies; in appointing staff. ASSAf supports the dual principle of equal opportunity and employment on the basis of merit and potential.

Vacancies are filled by promotion from within when this is permitted by law and justified by appropriate staff development and performance management considerations. When no suitable candidate is available internally, the search is extended to selection from outside (drawing in candidates through public advertisement; shortlisting by a core group drawn from the chair and at least two members of the selection committee appointed by the Council; solicitation of referees' letters; interview with the full selection committee). Only posts for which prior ASSAf Council approval with respect to the requirement and the budget has been obtained, may be filled.

ASSAf follows a remuneration policy that seeks to recruit, retain and motivate competent employees by means of a reward system that is both market- and context-related, and which differentiates on the basis of job responsibility and individual performance. A portion of an employee's remuneration is based on some individual and/or organisational measure of performance.

### **Institutional policy development**

The Academy through its governing Council has developed policies and guidelines for its activities as they became necessary. The initiation of the African Science Academies Development Initiative (ASADI) partnership with the US National Academies prompted the generation, proposal and adoption of the following items:

- Guidelines for proposals of science-based topics in terms of the ASSAf Act
- Guidelines for proposals of science-based topics (project proposals)
- Guidelines for the appointment of Study Panels and Forum Steering Committees
- Policy on Conferences
- Formation of a "Committee on Science for the Alleviation of Poverty" (first example of an ASSAf "Board")



- Brief for the Consensus Study on “Nutritional Influences on Human Immunity, with special reference to clinical tuberculosis and HIV infection” (first ASSAf Consensus Study).

These policies and guidelines are publicly featured on the ASSAf website at <http://www.assaf.org.za>.

## Financial management

ASSAf’s contract agreement with the National Research Foundation stipulates that the Foundation will provide complete financial services to ASSAf, including payroll services-related transactions. While limited customisation has been made possible to suit the Academy’s special needs, ASSAf follows the NRF’s extensive system of financial management and complies with all its regulations in respect of claims and ordering processes.

The ASSAf partnership with the US National Academies has made a major contribution to increasing the size of the Academy’s staff complement, and has greatly increased monthly turnover (not only of the funds falling under the partnership budget). This necessitated establishing a functional cost centre system that was long overdue. In July 2005, the existing three cost centres were expanded to seven, two of them for USNA-related expenditures (one called USGE for general developmental activities according to the Year One Workplan, and another called USIN for the first Consensus Study on Human Nutrition and Immunity). At the end of Year One, two further cost centres were established in preparation for Year Two activities – USPA for the Forum-type Studies on Poverty Alleviation, and USSC for the envisaged second Consensus Study. This has brought the total to nine.

The secretary/reception post rapidly evolved into a post of ASSAf Office Administrator, as all ordering and claims have to be processed with minimum delay, being the essential transactional linkage between ASSAf operations and the NRF’s finance department. Monthly financial reports for each cost centre must be scrutinised and certified for payment. This is because under the contract, the NRF provides bridging funding for three months of total ASSAf expenditure, provided this remains close to the expenditure projection drawn up in advance of each quarter, again within the ASSAf office.

*The ASSAf partnership with the US National Academies has made a major contribution to increasing the size of the Academy’s staff complement, and has greatly increased monthly turnover (not only of the funds falling under the partnership budget).*



Image: Quest – Science for South Africa

With the end-of-contract departure of the Academy's Administrator in November 2005, ASSAf reorganised its financial system by contracting with its part-time accountant, Morakeng Malatji, to assume wider responsibilities and accept the new designation of ASSAf's (part-time) Finance Officer. Under supervision of the President and the Executive Officer, he now arranges and oversees all reporting the Academy has to do in respect of its various funders, notably the Department of Science and Technology (under South Africa's Public Finance Management Act, the PFMA) and the US National Academies. With the assistance of the Office Administrator, reports and projections are prepared and adapted for various different purposes and to meet assorted requirements, with the support of the NRF's finance department. Each cost centre has a responsible manager, reporting to the appropriate supervisors on monthly expenditures and variances. The system of staff time-keeping is aligned with the cost centres, so that both labour costs and communal overheads can be accurately attributed to each centre each month – this was done retrospectively in year one of the USNA-ASSAf partnership, but will be done prospectively on the basis of budget estimates in Year Two (validated by accurate ongoing records). The finance management process has turned out to be one of the core elements in the growth and development of the Academy, and is establishing a basis on which ASSAf can set out to achieve financial independence and sustainability.

### Strategic Planning

The Academy is required to present its strategic plans on an annual basis in order to qualify for the Grants-in-Aid provided by the Department of Science and Technology (DST). The plans have to include specific key performance indicators and measures of their achievement or otherwise. The Council conducted a strategic review in early 2005 and issued a "Vision Statement" expressing the key aspirations and niche of the Academy in the South African polity. This was incorporated in the Strategic Plans submitted to the DST in July 2005.

In order to begin the process of generating a new, multi-year Strategic Plan that will provide a clear



Vision, Mission, Goals and Objectives for the Academy over the projected time-span of the ASADI project, the ASSAf Council requested the Executive Officer to draft a summary of the Academy's present strengths, weaknesses, opportunities and threats (i.e. SWOT analysis). This was considered at a Council meeting and a number of modifications were made, after which the document was circulated confidentially to all ASSAf members, asking them for comments and suggestions. After incorporation of most of these into a further version of the SWOT analysis, a special strategic session of the Council was held on 5 April 2006 to finalise the SWOT analysis and to decide on the main features of the evolving Strategic Plan. A mandate was subsequently given to the Executive Officer and other ASSAf staff to complete a first draft of the multi-year Strategic Plan. The Plan was presented for comment to key stakeholders during May-June 2006, before final discussions and refinement led to its adoption at the Council meeting held on 22 June 2006. The Strategic Plan was then submitted to the USNA programme officers and the ASADI Board, before being printed for extensive distribution inside and outside the Academy, posting on the ASSAf website, and included in the Memorandum of Understanding (MoU) signed with the US National Academies in July 2005.

### Key performance indicators for Programme 1

Legally sound operations of the Academy as a special kind of body under the Public Finance Management Act were achieved. A multi-year Strategic Plan was furthermore generated. Participatory and effective governance of Academy affairs was put into place, supported by an adequate infrastructure of support staff and facilities that ensures achievement of projects within set timeframes and budgets. The membership of the Academy grew by 13%, and the representation of under-represented disciplines and demographic categories increased (though not to the desired extent).

*Working towards a stronger national Academy*

## Report on a Strategic Approach to Research Publishing in South Africa



# Programme 2

## Strategic management of research journals

### Completion of pre-existing Consensus Study

#### Research Publishing in South Africa

The Academy of Science of South Africa (ASSAf) signed a contract in 2001 with the then Department of Arts, Culture, Science and Technology (DACST, now the Department of Science and Technology, DST) for various activities in connection with the “strategic management” of research journals published in South Africa. Two of these are described below:

- The enhancement and sustainable publication of the *South African Journal of Science* (SAJS)
- The establishment of a new science magazine to showcase South African scientific achievements to a wide national (later international) audience entitled *Quest – Science for South Africa*.

The third component was a comprehensive study of the present and best-possible future role of research journals published in South Africa, now completed through the release of a full report in March 2006, with evidence-based recommendations. The **ASSAf research journals project** was steered by a group drawn from experts in the field. These included representatives of the above-mentioned likely policy beneficiaries of the project, the DoE’s Higher Education Branch, the Council on Higher Education/ Higher Education Quality Committee (CHE/HEQC), the NRF’s Knowledge Management division, and researchers at the Human Sciences Research Council (HSRC) and other university-based centres who are concerned with the production and analysis of R&D indicators for the country as a whole. A particularly close partnership was fashioned with staff in the Department of Education’s Higher Education Branch who developed the current policy for recognising and accrediting research publication outputs of higher education institutions (part of the overall new institutional funding policy that is now in place).

That partnership was characterised by

- assistance provided in analysing the responses of editors of accredited journals to the annual request for updated, confirmatory information required under policy to maintain accreditation;
- accepting an informal brief to refine the current accreditation criteria promulgated by the department as part of the ASSAf research journals project; and



## Strengthening of South Africa's research journals

- joint planning as to future requirements of the system of measurement of research outputs as a multi-sector issue.

The ASSAf Council decided that the **open symposium/workshop** accompanying its Annual General Meeting in 2002 should be devoted to the Research Journals Project, and brought together as many participants in the national “journals system” as could be assembled. The main conclusions of this exploratory workshop were the following:

- The total number of (learned) journals published in South Africa relative to the number of publishing scholars was extraordinarily high.
- the commercial exploitation of journal publications in the electronic realm (without paying attention to the quality dimension) posed great risks, insofar as greatly increased access to potentially poor-quality articles through the huge, searchable Internet space may not reflect well on SA research and scholarship.
- Different authorities with an operational interest in article publication stood to gain from a successful ASSAf Project on the strategic management of SA research journals.
- The project needed “buy-in” from editors, publishers and researchers alike, but appropriate policy development could be a powerful driver.
- While feasible, moving from the national to the continental dimension should not be done in a unilateral manner from a South African base.

### The ASSAf Report on “A Strategic Approach to Research Publishing in South Africa”

The Academy Council decided that the work of the Steering Committee should be completed by a smaller report-writing team who would review the available evidence and make appropriate recommendations in a full-length report comprising the following:

- A scene-setting first chapter, followed by a second chapter, focusing on a largely scientometric analysis

### Steering Committee

A number of members of ASSAf (including some members of the then Council) agreed to serve on a Steering Committee for the project. They are:

- **Prof Wieland Gevers** (MASSAf) (Convenor)
- **Prof Anthony Mbewu** (MASSAf)
- **Prof Walter Claassen** (MASSAf)
- **Prof Krish Bharuth-Ram** (MASSAf)
- **Prof Marie Muller** (MASSAf)
- **Prof Iqbal Parker** (MASSAf)

A number of other persons with a direct interest in South African science journals were also recruited, namely:

- **Dr Molapo Qhobela** (Department of Education (DoE, Higher Education branch))
- **Dr Andrew Kaniki** (Knowledge Management, National Research Foundation)
- **Prof Johann Mouton** (MASSAf) (Centre for Research on Science and Technology (CREST), Stellenbosch University)
- **Dr William Blankley** (Knowledge Management Research Programme, Human Sciences Research Council (HSRC))
- **Prof Michael Cherry** (South African correspondent for “Nature”, Stellenbosch University)
- **the late Dr Prem Naidoo**, Council on Higher Education (CHE)/Higher Education Quality Committee (HEQC).

This created an 11-person Steering Committee, capable of launching the project and taking care of sub-projects.

## *Africa's premier multidisciplinary research journal, now in its second century*



### **Prof Wieland Gevers**

ASSAf Executive Officer and Convener of steering committee for strategic management of research journals

of ISI-listed journals published in South Africa, and on publications in the ISI databases emanating from authors with South African addresses. The analysis points to a clear need for support of selected local journals to improve and entrench their position in the ISI system, and the existence of possible opportunities for locally published journals in a number of new areas that must, however, be carefully contextualised in terms of their potential appeal to international authors as well as to South African scholars willing to transfer their papers to high-quality local journals.

- A third chapter, providing a comprehensive analysis of research publications in South African research journal emanating from authors with South African addresses since 1990, respectively published in journals listed in the three authoritative, multi-sector databases of Thomson ISI (recently all granted automatic accreditation, for purposes of subsidy as a research output, by the DoE), in South African journals granted accreditation by the DoE as a supplementary listing against published criteria. This analysis presents a general picture of South African journals as being differentiated into several categories. There is a small cluster of South African journals (both ISI and non-ISI, mostly in the natural and health sciences but also in some of the social science and humanities) that have “acceptable” impact factors, record moderate to high citations from non-South African authors and generally present an “international” profile. At the other extreme, there is a substantive cluster (perhaps affecting as many as half of all South African journals) that does not have any international visibility in that articles in these journals are not cited outside South Africa, and the production of content is dominated by one or two institutions and in some cases by the same institution (or department) that publishes the journal.
- A fourth chapter, reporting and analysing a recent, full-scale survey of editors’ opinions and related information conducted by ASSAf of the editors of all ISI-listed and other DoE-accredited journals published in South Africa, based on a questionnaire sent to the editors of all journals accredited by the Department of Education. The intention was to obtain relevant opinions and related information from this sector, focusing on draft criteria for the accreditation of South African research journals



*ASSAf will have secured an established and respected role in promoting research publishing in South Africa through the implementation of the recommendations of its 2006 Journals Report.*

drawn up by the Steering Committee for this project. Of the 213 journals captured in the database, five journals were listed in the International Bibliography of the Social Sciences (IBSS), and 15 in the Thomson Scientific (Thomson ISI) databases, while the remaining 193 South African journals were accredited only with DoE. The editors took considerable trouble in completing the questionnaires, with a return rate of 100%. They appear as a group to devote much time and effort to their task, few being professionally trained or provided with significant office/logistic support.

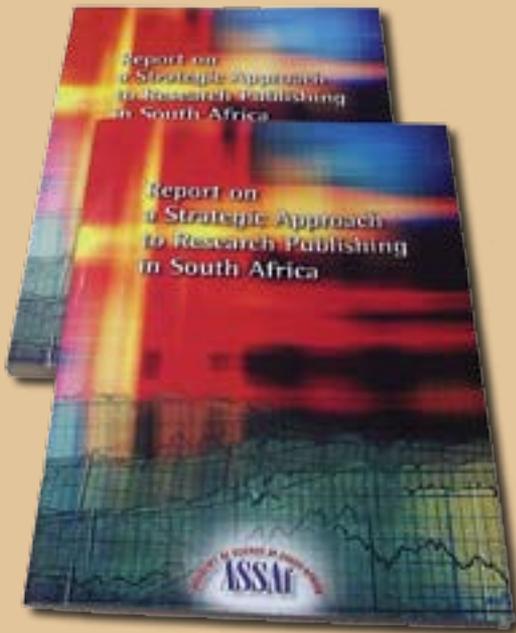
- A fifth chapter, discussing the global e-Research trends and their implications for South African research publishing in print or online, as well as the coming revolution in research publishing connected with electronic information technology (Internet-based, on-line publishing and access) as it is already affecting South Africa, and will do so increasingly in future.
- A sixth and final chapter pulling together the conclusions of all the preceding material and making recommendations to the full range of participants in the knowledge production system. The chapter focuses on policy implications for various government departments and agencies that arise from the study, including but not limited to the subsidisation of good-quality research outputs by the DoE; quality assurance of institutional research activities as assessed by the Council on Higher Education (CHE) through its Higher Education Quality Committee (HEQC); funding of researchers by the National Research Foundation (NRF) and other agencies; and the monitoring of Research and Development (R&D) indicators in the National System of Innovation (NSI). The report presents a scenario in which
  - the editors and editorial boards of South African research journals might subscribe to an agreed, general code of best practice;
  - indexing in internationally recognised databases is energetically sought (and supported by relevant agencies);
  - online publishing, with or without print, is standard;
  - open access, in both Gold and/or Green Route mode, is a prime target, with author payment,



■ **Dr Xola Mati**

ASSAf Projects Director and Study Director of the report on "A Strategic Approach to Research Publishing in South Africa"

## *Linking South Africa with international scientific communities*



contributed by the respective host institutions as part of a nationally agreed model, enabling universal free on-line access;

- local journals provide a significant amount of enrichment content to enhance their value to their different stakeholders;
- substantive editing and peer-reviewing work is recognised in the general reward systems as valuable and highly skilled service;
- training programmes are readily available for all kinds of aspects of the industry;
- the possible expansion of (private sector) consolidated editorial and publishing services is explored so as to permit editors to concentrate on their critical editorial functions; and
- training and skills-upgrading opportunities for editors, editorial assistants and aspirant professionals in the field are available in the country.

### Dissemination of the Report

A first print run of 2 000 copies of the report was printed and distributed as indicated below.

- Since the report is an output of a 2001 contract with a government department, the Department of Science and Technology (DST), the Minister and Director-General of Science and Technology were given first sight of the final report, as a “deliverable” under the contract which ends and must be reported on, in both narrative and financial form, within five months after 31 March 2006.
- The Report was presented at the Centre for Research on Science and Technology (CREST) and Council on Higher Education (CHE/HEQC) Workshop for South African Higher Education Institutions Research Directors and Deans held on 22–23 March 2006 in Stellenbosch. Members of the report-writing team introduced the report, presented the authored chapters, and explained the ten recommendations.
- The Minister, Director-General and all Deputy Directors-General of Education each received a copy of the report, plus extra copies for use in house, with an offer to present the report to the Department



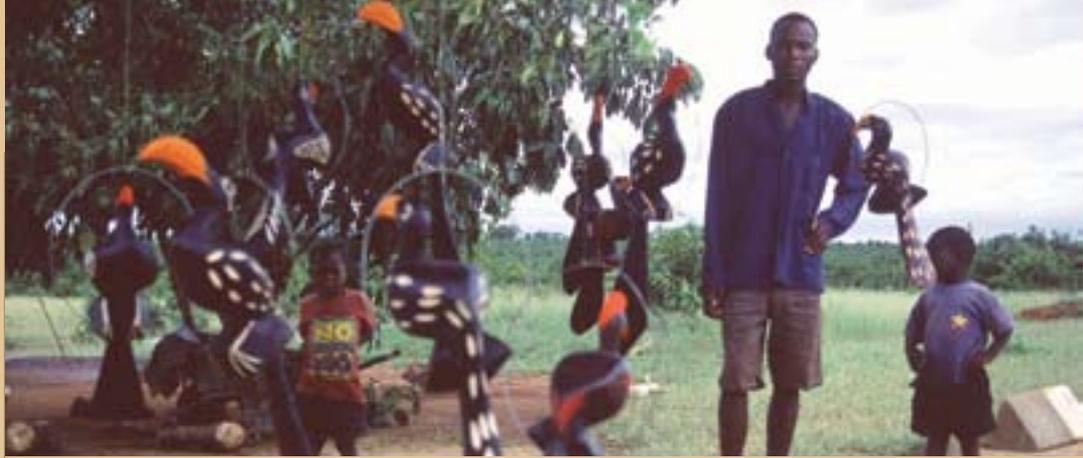
and to discuss its recommendations and their implications. Copies of the report were also sent to each of the Ministers and Directors-General of: Agriculture, Health, Communications, Environmental Affairs and Tourism, National Treasury, Trade and Industry, and to each of the Parliamentary Portfolio Committees corresponding to all relevant departments as stated above.

- Copies of the report were sent to the Chief Executive Officers and Chairpersons of Higher Education South Africa (HESA), the Council on Higher Education (CHE), the National Advisory Council on Innovation (NACI), the National Science and Technology Forum (NSTF), in each case with an open offer to present the Report to the Executive and/or the next Annual General or plenary meeting.
- Each of the 261 members of the Academy received a copy of the report. About three copies were sent to each of the sister academies in Africa (Nigeria, Kenya, Senegal, Madagascar, Ghana, Cameroon, Uganda, Zimbabwe, Zambia, Tanzania, Egypt, African Academy of Sciences-AAS) and to academy-like bodies in other African countries such as Namibia, Botswana and others. Copies of the report were also sent to TWAS, the ICSU main and Africa office, the NEPAD S&T Secretariat, the IAP, and other international bodies linked to ASSAf. International dissemination included the US National Academies and selected individuals in the USNA-ASSAf partnership, the Royal Society, the Russian Academy of Sciences, the national science academies of India, Brazil, Mexico, Chile, France and selected others.
- Each of the 213 editors and publishers of the South African published journals who took part in the ASSAf Survey described in Chapter 4 of the report also received a report. Copies were sent to each of the “deposit libraries” (State National Library branches, Parliamentary Library, Constitutional Court, and others).
- Sets of copies of the report (about 25) were sent to the Vice-Chancellors or equivalents of each of the 21 South African universities, technikons or universities of technology, with the request to distribute them among Deputy Vice-Chancellors or Vice-Rectors, Deans and librarian(s). Sets of copies (about 15) were sent to the Presidents or Chief Executive Officers of each of the eleven South African Science Councils or equivalents, with the request that they be appropriately distributed within their organisations.



Image: Quest – Science for South Africa

*ASSAf's research journals project reveals that the majority of research journals published in South Africa appear infrequently, contain few articles and are poorly cited in the world literature. The project has the potential to have an enormous effect on the entire chain of knowledge production. It can enhance South Africa's standing in the global academic marketplace and result in an immensely valuable brain gain and re-gain, as well as in more targeted funding of the really productive research groups.*



■ Plans were put in place to contract a science journalist and media consultant to present the report to the Press and other media, using a one-page press release and the Executive Summary of the report, plus extra copies of the report on request. Favourable articles on the report were featured internationally in “Science” and the website service SciDev.Net, as well as in many national newspapers and news magazines.

The **ASSAf Report on “A Strategic Approach to Research Publishing in South Africa”**, of which the “Executive Summary and Recommendations” section is attached, begins with a description and analysis of the present state of research publishing in South Africa. The report presents a number of generic assertions on different but inter-related aspects of the subject, most of which can justifiably be said to have stood the test of empirical investigation described in the chapters by their respective independent but collaborating authors. Most importantly, the test of continuing relevance of core best practice in a changing-world publishing system has been confirmed, despite the urgent need for that core to undergo a safe passage into an evolved and adapted model in the modern cyberworld.

The report takes up the challenge of making conclusions and strategic recommendations in the light of the outcomes of the investigations reported in Chapters 2–5. This is done in a serial consideration of the assumed individual perspectives of important stakeholders in the field, building up from this a defining set of aggregate strategic recommendations that can benefit the whole South African system of innovation in particular, and our society and polity in general.

ASSAf's research journals project reveals that the majority of research journals published in South Africa appear infrequently, contain few articles and are poorly cited in the world literature. The project, through its imminent recommendations, has the potential to have an enormous effect on the entire chain of knowledge production from the training of young scientists to the establishment of new norms of high-quality publication. It can enhance South Africa's standing in the global academic marketplace and result in an immensely valuable brain gain and re-gain, as well as in more targeted funding of the really productive research groups.



*ASSAf will have succeeded in making the South African Journal of Science into Africa's highest impact research journal, offering worldwide open access to full-text at all times.*

The Academy is poised to become a key link in partnership between different government departments through its evolving role in the accreditation of journals recognised for supply-side subsidy of research outputs, with implications for more effective quality assurance and more reliable indicators of productivity and impact. If the Academy is to establish a portfolio function of research outputs accreditation for the S&T system, it will need additional resources to establish the core steady-state competence and the supporting networks that will provide the expected benefits in a relatively short time. In addition, the proposed framework for South African research journals recommended for the project includes provision for targeted and well-managed financial support for high-quality journals that are listed in international databases, complementing own-revenue from a mix of page charge subscriptions and advertising.

To implement some of the brief recommendations as outlined in the report, ASSAf is setting up a **Committee on Research Publication in South Africa** and a **Research Publication Office** to undertake the process of implementing those recommendations in the report that can be initiated by the Academy under the supervision of the Projects Director, Dr Xola Mati.

## **Publishing the South African Journal of Science**

### *A "Nature" for South Africa*

The *South African Journal of Science* continues to showcase a great diversity of original work by researchers throughout the country and abroad, concentrating on articles that have an appeal that is wider than that of single disciplines. Among the highlights of the volume published in 2005 were a number of articles featuring the research at historically black universities supported by the Royal Society-NRF bilateral programme. The journal appears six times a year, and is accessible online as one of the e-publications managed by SABINET. The editor is Dr Graham Baker, who was supported in the year by editorial assistant Ms Eldaleen Jacobs (who was succeeded by Ms Lizel Kleingbiel in February 2006) and Prof G Michael Berger (MASSAf) is part-time associate editor. To mark the hundredth year of



**Dr Graham Baker**

Editor of the *South African Journal of Science*

Published by ASSAf

*Quest – Science for South Africa will be a science magazine with national impact in the domains of school education, public understanding of science, and science literacy.*



**Dr Elizabeth Lickendorf**

Editor of *Quest: Science for South Africa*

Published by ASSAf

publication of the *South African Journal of Science*, the Academy made a number of special awards, one to Dr Baker for his thirty years of outstanding work as editor, one to Prof Johann Lutjeharms as the single most prolific author of articles over the last two decades, and one to Prof Phillip Tobias (ASSAf) for exceptional services to the journal during his career.

In a recent bibliometric analysis, the *South African Journal of Science*, which is one of about twenty research journals published in South Africa indexed in the authoritative international Thomson Scientific ISI system, achieved the highest impact factor among multidisciplinary journals from developing countries, and was the only South Africa-based journal ranked in the second quintile among its international counterparts (see Pouris A. *S.Afr. J. Sci.* **100**, 515–517; 2004).

The number of articles submitted to the journal increased by 60% in the last three years, and continues to grow steadily. In order to ensure that articles by the country's young scholars are also published, the editor and associate editor take considerable trouble to mentor and support researchers who are inexperienced at presenting their work for publication in international-level journals.

### **Publishing Quest**

#### **A quarterly magazine of high quality, presenting science for South Africa**

The Academy continued the publication of its science magazine *Quest – Science for South Africa* that was launched in 2004. *Quest* serves as a platform for communication about actual scientific research in South Africa. It strives to showcase South African science in action, and is aimed at the broad scientific community, decision-makers, the public and students, and at inspiring the senior grades at secondary schools.

In the **public sector programme**, a sponsored copy is sent to every secondary school in South Africa teaching science and mathematics. Feedback from these schools is very encouraging. Arrangements are in place for *Quest* to be used extensively and cooperatively in those projects and initiatives of the Departments of Education and of Science and Technology, as well as of the South African Agency for the



## Communicating up-to-date South African scientific research to the public

Advancement of Science and Technology (SAASTA), that are aimed at enhancing the performance and aspirations of South African learners in these fields. Paid subscriptions from a small initial reader base have grown to over 200, and over 500 copies of *Quest* are now sold each month in selected book stores.

Dr Elisabeth Lickindorf, one of South Africa's most experienced science writers, continues as editor of *Quest* on a contract basis.

*Quest* is not a peer-reviewed journal for original research, but it is the ideal medium to convey information about current South African scientific achievements to a wide audience, often in the form of shorter, more generally understandable versions of the findings published in research journals.

The Academy seeks to develop this complementarity and synergy with South African peer-reviewed research journals by inviting editors and authors to bring to the attention of the editor of *Quest*, articles that may be of interest to a more general readership and to encourage authors of key articles to approach *Quest* with their stories.

*Quest* covers the spectrum of science from the natural sciences to the social and human sciences, with a focus on research that is up-to-date and evidence-based, and in which scientific method is applied.

### Key performance indicators for Programme 2

The major study of research publishing in South Africa was completed within the agreed extension period (by end of March 2006), and the ensuing report was handed to the Ministers of Science and Technology and of Education, apart from the targeted distribution of over 1 800 copies throughout the national system of innovation. The *South African Journal of Science* has gone from strength to strength, and has increased its impact factor by 10%. *Quest – Science for South Africa* is widely used in connection with science-promotive events and initiatives throughout the country, and has achieved recognition as the country's leading science magazine, of international quality.



# Programme 3

## International activities

### ASSAf as a member of an international community of academies

World interacademy organisations are maturing; new opportunities for African science academies

#### InterAcademy Panel (IAP) and InterAcademy Council (IAC)

ASSAf is an active member of the IAP, which is a growing organisation that embraces the science academies of over 90 countries. IAP panel meetings are hosted in Trieste, Italy, by the **Academy of Sciences for the Developing World (TWAS)**.

In the same way that national academies of science provide science-based advice to national governments, international associations of academies can provide international authorities with advice on matters of global importance. This role is being actively pursued by the IAP. On the African continent the **Network of African Science Academies (NASAC)**, comprising all nine of the national science academies so far established in the 54 countries on the African continent, is poised to play this role, and will link up with NEPAD.

**The InterAcademy Council (IAC)** is an operating arm of the IAP. It is governed by a 15-member board elected from the 95 member academies of the IAP. ASSAf was one such elected member during 2002-4, and was represented on the board by Prof George Ellis. A new board took office in 2005, and ASSAf was rotated off the board. The IAC completed, with input from ASSAf, a major study on a strategy for building worldwide capacities for science and technology. The **report entitled “Inventing a better future: A strategy for building world-wide capacities in science and technology”**, was presented to UN Secretary-General Kofi Annan in New York City on 5 February 2004.

The IAC also completed its study on science and technology strategies for improving agricultural productivity and food security in Africa in a report entitled “Realizing the promise and potential of African agriculture”. Two South Africans served on the study panel: Ms Bongiwe Njobe, then Director-General of the Department of Agriculture, and Prof Jennifer Thomson, a member of ASSAf.



Image: Quest – Science for South Africa



## *Linking South Africa with international scientific communities*

The IAP operates a number of important multi-national programmes in which national academies from various countries are voluntarily involved. The **Global Water Programme** recently received approval for its draft “Plan of Action” submitted during the year to the IAP Executive Committee. As many as 41 Academies of Sciences have to date shown interest in getting involved in this programme. ASSAf, as one of the first, helped organise the IAP Science Education and the Global Water Programme for 2006.

As part of the IAP Global Water Programme, the Water Research Commission of South Africa, on behalf of the Academy of Science of South Africa (ASSAf), will be organising a 3-day **workshop** (16–18 August 2006). The objective of the workshop is to bring together water researchers and high-level water managers to discuss the major problems that they are facing and to find possible solutions to these problems. A number of African science academies have expressed their interest in participating, namely those of Kenya, Tanzania, Uganda, Egypt, Ghana, Nigeria, Cameroon, Madagascar, Morocco, Zimbabwe and Senegal, as well as the Africa Academy of Sciences.

At the IAP-supported symposium on **improving science teaching in Africa** held in Dakar in March 2005, it was decided that there would be several follow-up activities. One of these was to be a workshop to discuss the development by the Network of Academies of Science of Africa (NASAC) of voluntary content tests for science teachers across the continent. The **Science Education Workshop** was organised by ASSAf staff together with Diane Grayson (MASSAf), and attendees were invited through the national science academies that are members of NASAC. An additional delegate from Sudan was invited at the suggestion of Mohamed Hassan of the IAP. The workshop was held on 23–24 March 2006, partly sponsored by the IAP (through two grants totalling USD 11 000) and partly by ASSAf. The main objective of the workshop was to find ways to ensure that teachers have the necessary content knowledge to teach science competently. It was agreed that a great deal more had to be done in regard to this aspect of the teaching of science at African schools and would involve changing prevailing policies regarding science teaching in Africa as a whole. The science educators present all agreed that it would be best if African countries could work together on this massive task. A workshop report will be issued to the participants and all African science academies as well as to other stakeholders.

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*ASSAf is a founding member of the nine-member Network of African Science Academies. NASAC meetings are hosted by the African Academy of Sciences in Nairobi, Kenya. Prof Wieland Gevers, as then President of ASSAf, attended the General Meeting of NASAC in Abuja, Nigeria, during September 2004. ASSAf was elected to be Vice-President of NASAC.*

### Network of African Science Academies (NASAC)

ASSAf is a founding member of the nine-member Network of African Science Academies. NASAC meetings are hosted by the African Academy of Sciences in Nairobi, Kenya. Prof Wieland Gevers, as President of ASSAf, attended the General Meeting of NASAC in Abuja, Nigeria, during September 2004. ASSAf was elected to be Vice-President of NASAC.

The United States National Academies have launched a multiyear programme called the **African Science Academy Development Initiative** to contribute to the development of capacity among member academies of NASAC. This is reported on extensively below.

The Royal Netherlands Academy of Arts and Sciences (KNAW) arranged a working visit for the African Academy members of NASAC to their headquarters in Amsterdam. The meeting was held from the 29th January to 6th February 2006 and included a one day visit to Brussels to familiarize the members with the European Union mechanisms for the support of scientific collaboration between African and the member states of the Union. The President attended the meeting on behalf of the Academy. Besides gaining valuable insights into the way in which the Netherlands Academy operates both on a national scale and in Europa, the meeting provided an opportunity for the participating Academies to discuss the NASAC strategic action plan, a draft of which had been prepared by Prof. Gevers. The outcome of these discussions was a proposal that a revised plan should be developed, that funding for the encouragement of scientific collaboration between African scientists and their European counterparts should be sought from the EU, and that the details of the proposal should be discussed later in 2006 when the NASAC member academies had their next formal meeting.

### TWAS: the academy of sciences for the developing world

TWAS is an international academy of science with individuals as Fellows and focusing on developing countries. It is headquartered in Trieste, Italy. TWAS manages a number of schemes for the promotion of science and technology in the developing world. It announced a **TWAS Young Scientist Prize** to South



Africans, administered for TWAS and the South African Department of Science and Technology by ASSAf. The rules and regulations that had been compiled by the former General Secretary of ASSAf, Prof Parker, were approved and an awardee, **Prof Vivian Alberts**, was selected by a special selection committee chaired by Dr Philemon Mjwara (MASSAf).

**Citation:** *This award is made to Professor Vivian Alberts of the University of Johannesburg in recognition of his research findings in the field of novel thin-film photovoltaic cells. We believe that the potential economic and socio-economic value that work of this calibre holds deserve to be publicly acknowledged.*

*Prof Alberts has been conducting research in novel thin-film photovoltaic materials at Rand Afrikaans University in Johannesburg since 1992, while also fulfilling the demands of an academic career. Peer-reviewed papers in leading international journals, based on his work, with Prof Alberts as author or co-author, numbered 52 until the end of 2004.*

*During the period December 2002 – January 2005, Prof Alberts achieved a seminal conceptual breakthrough in the technology for manufacturing thin film CIGS (Copper-Indium-Gallium-Diselenide) photovoltaic cells by a process that is both industrially scalable and commercially inexpensive. This breakthrough made it possible to manufacture high-quality, durable and effective solar cells and panels at a cost that is 20% of the current cost of imported panels in South Africa. The projected production costs are low enough to undercut the cost of coal-fired electricity generation.*

*The social and economic impact of his research work is threefold. It promises to generate a leading global industry with its intellectual centre in South Africa (due to the patenting of the associated technology by Prof Alberts and RALI, and the worldwide potential for installing solar PV). This would add significantly to South Africa's technological competitiveness and possible foreign exchange earning. The low cost of producing solar panels with this technology provides an exceptional opportunity for the South African government to supply electricity to the approximately 2 million national households that are not connected to the national grid, thereby giving a major boost to the socio-economic development (specifically in terms of educational services, health services and industrial establishment) of underdeveloped communities. The enormity of the potential global market for low-cost photovoltaic installations*



**Prof Vivian Alberts**

Winner of the TWAS Young Scientist Prize

## Seeks to mobilize and apply scientific thinking and knowledge



■ Prof A Mbewu (MASSAf)

Represents ASSAf on the InterAcademy Medical Panel (IAMP), of which he is co-chair

*promises to generate a significant new job market in South Africa, addressing one of the most serious socio-economic problems facing our country.*

*It needs to be emphasised that Prof Alberts' invention has relied on a deep and subtle understanding of the physics of materials, as well as a gift for innovative thought and exceptional laboratory skills. The process that Dr Alberts has invented solves a problem that has plagued the world's leading researchers in the field for many years. He has been sought out to address audiences on the invention on various international platforms.*

### InterAcademy Medical Panel (IAMP)

Prof A Mbewu (MASSAf) represents ASSAf on the IAMP, which considers health-related issues at an international level. He was recently elected Co-Chair of this panel, and will be supported by ASSAf staff in meeting the demanding obligations of this leadership position.

### International Human Rights Network of Academies and Learned Societies (IHRN)

Professor Chabani Manganyi (MASSAf) represents ASSAf in the IHRN, which mobilises international support for scientists who are unjustly treated or prevented from practising science on political grounds.

### The African Science Academies Development Initiative (ASADI)

This initiative was launched in late 2004/early 2005 by the **United States National Academies (USNA)**, and came at a critical time for the Academy of Science of South Africa (ASSAf). With a short history, having been established as a voluntary association in 1996 and given statutory recognition by the South African Parliament as late as 2001, the Academy has had to establish its credentials and spread its wings in a crowded system of national science institutions with many overlapping functions and aspirations. What applied to South Africa, applied equally to the continental science scene, with the recent establishment of the Network of African Science Academies (NASAC) representing one of the first signs that the "academy



idea” might also have a role to play in the development of Africa.

It was fortunate for ASSAf that the ASADI delegation that visited seven of the existing African science academies found in South Africa an impressive receptiveness, on the part of the principal government departments and agencies that were visited, of the notion that ASSAf might become useful to them as an independent, authoritative source of evidence-based advice on key problems for which they needed policy-driven solutions. This, taken together with the commitment of the Academy Council to a national role for the Academy that would transcend the purely honorific focus of traditional academies, led to **ASSAf being chosen as one of USNA's three “intense partners”** in ASADI, with funding of USD 1,5 million over 5 to 7 years within a framework of annual reporting and review. The South African project was also embedded in the larger design of a collaborative developmental project for all of the seven participating African national science academies. **A Memorandum of Understanding (MoU)**, complete excepting for an ASSAf Strategic Plan to be generated and approved after the first year of the partnership) was agreed and signed by both partners, together with a formal USNA-ASSAf contract. The first funds arrived from the USA on the initiating day of the partnership, 5 July 2005.

In summary, the task of building ASSAf’s capacity to serve South Africa in ways that resemble those in which, for example, the USA is served by the US National Academies, amounts to taking forward an organisation that in the first 10 years of its existence has produced only one national advisory report, is largely unknown or unrecognised in the ranks of government officials dealing with policy issues, and has been pre-occupied with establishing itself in a highly problematic historical setting.

## Planning Process

### Developing the “Year One” Workplan and budget

Drawing up an annual Workplan and associated budget is a contractual requirement for ASSAf to received funding from USNA in each year of the partnership. Using the provisions of the MoU, the approach was to design the Workplan as a series of specific activities. For each of these it was necessary to generate an equally



■ Prof Chabani Manganyi (MASSAf)

Represents ASSAf in the International Human Rights Network of Academies and Learned Societies



Image: Quest – Science for South Africa

## *Working towards a stronger national Academy*

specific budget. Many of the policies and norms needed for this purpose did not yet exist in the operations of the Academy, and the process had the invaluable spin-off of promoting the institution or adoption of well-considered policies, either de novo or as adaptations of policy frameworks used by our finance operations and human resources contractor, the National Research Foundation (NRF). Some of the envisaged activities were novel in the experience of the Academy (for example, setting up a Consensus Panel), and for this purpose it was very helpful to adopt or adapt USNA policies and practices, modelled in the South African reality, and thus specify the numbers of persons who were likely to need travel assistance and other financial resources to assist the Academy in its work (see separate sections below). Much of the Workplan necessarily had to be based on estimates of cost, scope and time likely to be needed for each activity built into the Plan. The activities of the Workplan were also described in a Gantt Chart spelling out the milestones, instrumentalities, skills gains and policy developments that it was hoped would ensue from each of them.

The first drafts of the “Year One” Workplan, the Gantt Chart and the associated activities-based budget were sent to the responsible USNA Program Officer, Dr Barney Cohen and to the responsible USNA management accountant, Mr Jim Banihashemi, for comment and suggestions for improvement. Valuable inputs were made, such as the serious questioning of our approach to (domestic) travel budgeting, and an indication that staff timekeeping in respect of different projects running out of different cost centres would be an indispensable tool for both budgeting and project-focused financial management in general. The activities-based draft budget was also helpfully converted to a template-based version in USD by Mr Banihashemi. The updated documentation as agreed with the USNA staff was now circulated to all members of ASSAf with a request to comment both on specifics and on the general programme of work envisaged under the Workplan, Gantt Chart and budget. While valuable suggestions were received, the main benefit was to familiarise ASSAf members with the new partnership and its implications for them in terms of enhanced opportunities of serving the Academy in the ways outlined in the Workplan. Finally, the ASSAf Council considered and approved the pre-final drafts of the three documents at its subsequent formal meeting in April 2006.



Submission of the Council-approved documentation to the USNA officials was followed by approval of the ASSAf “Year One” Workplan by the Board for ASADI, followed by transmission of the first tranche of the funding on 4 July 2006, effectively initiating the project.

**Programmatic activities designed to build the Academy’s capacity to provide independent and authoritative consensus advice, based on the best available evidence, professionally generated, reported and disseminated**

### *Study-topic selection from within the Academy*

ASSAf members were invited to propose study topics that in their view represented serious problems facing the nation and that might be amenable to evidence-based analysis and the generation of consensus recommendations to government and other agencies in South Africa.

The Council decided to “fast-track” a number of the proposals received, and suggested in each case that the topic could best be approached as either a “consensus study” to be undertaken by an appointed expert panel, or a “convened, forum-type study” to be addressed through/at consultative meetings of appropriate persons representing different points of view or sectoral interests.

The ASSAf Council provisionally selected a number of study topics to be further developed to full proposals as soon as possible, according to the approved guidelines for proposals of science-based (evidence-based) topics to be examined by ASSAf in the national interest:

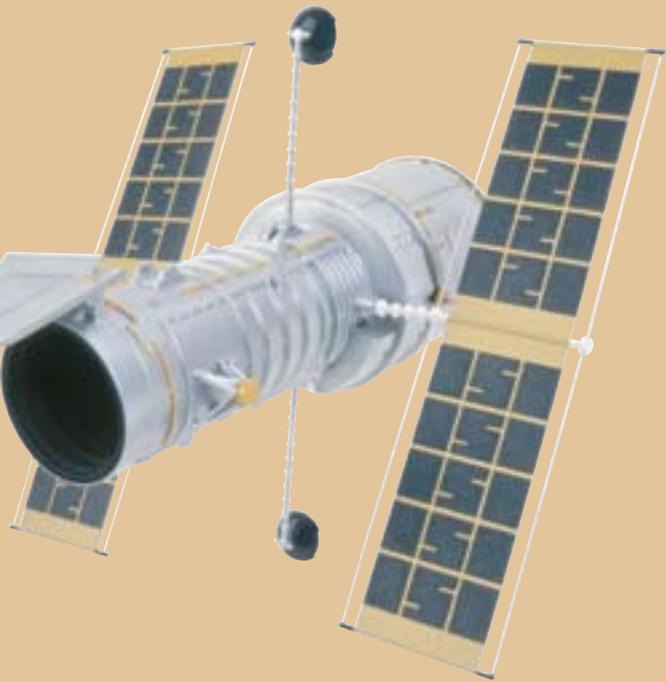
**Year One:** Consensus Study: Nutritional influences on the human immune system  
(Proposers: Prof W Gevers (MASSAf) and Prof J Volmink (MASSAf))

Convened Study: Health-professional personpower for the HIV-AIDS era in South Africa  
(Proposer: Prof S Benatar (MASSAf))

Consensus Study: Review of South Africa’s National Biotechnology Programme  
(Proposers: Prof R Crewe (MASSAf) and Dr R Adam (MASSAf))



Image: Quest – Science for South Africa



*The ASSAf Council is mindful that the focus of the Academy's work should be on the scientific analysis of already available, enquiry-generated evidence that can help policy development in South Africa, rather than on prospective research.*

## *The application of scientific thinking for the benefit of society*

**Year Two:** Consensus Study: The science behind effective science education for South Africa's young people (Proposers, in various formulations, Dr P Whitelock (MASSAf); Prof B Wingfield (MASSAf); Dr A Paterson (MASSAf); Dr J Sharpey-Schafer (MASSAf))

**Other topics proposed** (if further developed and approved): Food and nutrient security, including the role of genetically modified crops; environmentally sustainable cities; climate change in South Africa; appropriate genetic testing; mental health in a diverse society ; impact of donor intervention in the HIV-AIDS pandemic; preparation for possible influenza pandemics; a comprehensive approach to the HIV-AIDS pandemic; language of instruction and effective learning in schools; literacy promotion; etc.

The ASSAf Council is mindful that the focus of the Academy's work should be on the scientific analysis of already available, enquiry-generated evidence that can help policy development in South Africa, rather than on prospective research. This distinguishes its niche from that of the science councils such as the Council for Scientific and Industrial Research (CSIR) and the Human Sciences Research Council (HSRC).

### *Consensus Study: Nutritional influences on human immunity, with special reference to tuberculosis and HIV infection*

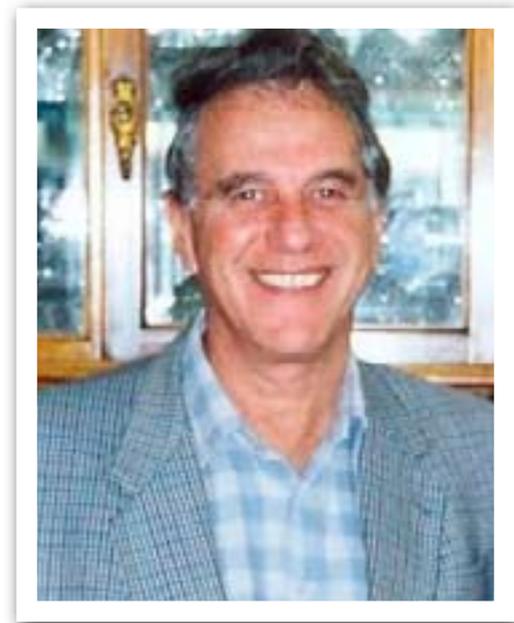
The issues concerning nutritional influences on human immunity and response to major pandemic infections, such as M.tuberculosis (Mtb) and the human immunodeficiency virus (HIV) infections, have been amongst the most controversial in South Africa in the last half-decade. These issues have given rise to serious differences in the approach to public policy in addressing the ravages of these diseases. There has been a belief in some quarters that poverty and under/malnutrition may themselves be the main aetiologic agents of Acquired Human Immunodeficiency Syndrome (AIDS), with HIV infection being a non-contributory or trivial supervening circumstance. Others consider nutritional deficiencies to be an, or even the, appropriate target of primary therapy of "HIV infection and AIDS". The majority view, however, is that nutritional support of persons infected with either Mtb or HIV, or both, is a necessary



and helpful part of a therapeutic approach that primarily concentrates on the eradication or, at least, control of the infected state in each affected person. In addition, there is a plethora of products available over-the-counter in the country that purportedly favourably “modulate” the immune system to prevent or ameliorate HIV and/or Mtb infections. These products range from “nutritional factors” present in certain foods to processed “drugs” that are probably outside the realm of nutrition.

### Study Panel List

Name	Expertise relevant to the Study
<b>Prof Jimmy Volmink</b> (MASSAf)	Evidence-based health care, epidemiology and meta-analysis
<b>Prof Wieland Gevers</b> (MASSAf)	Metabolism, nutrition, infectious diseases, human genetics
<b>Prof Barry Mendelow</b> (MASSAf) – Chairperson	Haematology/Oncology expertise
<b>Prof Hester Vorster</b> (MASSAf)	Physiology and public health nutrition
<b>Prof Gregory Hussey</b> (MASSAf)	Micronutrients, immunity and infection
<b>Prof Dan J Ncayiyana</b> (MASSAf)	Public health and health politics; medical publishing professional
<b>Dr Clive M Gray</b>	HIV immunology, HIV vaccine development, vaccine immunogenicity testing, measurement of HIV-specific T cell responses, T cell memory lineage
<b>Dr Francois Venter</b>	HIV (clinical work)
<b>Dr Agatha M Masemola</b>	HIV immunology and medical biochemistry
<b>Dr Muhammad Ali Dhansay</b>	General nutrition (and immunity), micronutrients (and immunity)
<b>Prof Glenda E Gray</b>	Perinatal HIV research
<b>Prof Helen Rees</b>	Reproductive health, sexually transmitted infections and HIV
<b>Prof David N. McMurray</b>	Immunity: Pathogenesis and immunoregulation in tuberculosis
Prof Bernard Msamanga	HIV/AIDS, population and nutrition, primary health care, immunisation, health sector reforms



**Prof Barry Mendelow** (MASSAf)  
Chairperson of the Consensus Study Panel

*The Academy is committed to providing advice to the government and the nation on key issues requiring scientific enquiry and analysis. Other government or state-appointed bodies also have well-defined roles in this domain. However, the efforts of these bodies have failed to date to resolve the controversial and publicly confusing situation in respect of the role of nutritional factors in enhancing or impairing immunity and thereby affecting morbidity and mortality from pandemic diseases such as tuberculosis and HIV infection leading to AIDS.*

**Why the need for the project and the link to the Academy?** The Academy is committed to providing advice to the government and the nation on key issues requiring scientific enquiry and analysis. Other government or state-appointed bodies also have well-defined roles in this domain. However, the efforts of these bodies have failed to date to resolve the controversial and publicly confusing situation in respect of the role of nutritional factors in enhancing or impairing immunity and thereby affecting morbidity and mortality from pandemic diseases such as tuberculosis and HIV infection leading to AIDS. It was accordingly considered that, in the national interest, South Africa's independent national science academy, ASSAf, had a responsibility to provide much-needed authoritative advice in respect of the proposed topic. Professors Wieland Gevers (MASSAf) and James Volmink (MASSAf) proposed the topic and were appointed interim co-chairs of a small group also comprising Professors Hester Vorster (MASSAf) and Barry Mendelow (MASSAf), who were tasked to make recommendations for the membership of the Study Panel to be appointed by the Council. The group was temporarily assisted by Dr Liesl Grobler.

**Appointment of the Study Panel Members:** The Interim Co-chairs conferred with each other a number of times, and strenuous efforts were made to assemble all the necessary bio-data and other information to constitute a Study Panel along the lines of the approved Guidelines. They sought to provide a balance between

- expertise in human immunology and infectious diseases;
- human nutrition, and within that, macronutrients and micronutrients;
- evidence-based approaches to human interventional and other types of studies;
- long experience and "current thinking";
- gender group and population group perspectives;
- deep involvement in the topic and the ability to bring fresh thinking from outside;
- national and international, including African continental, contributions;
- larger size of the Panel and a smaller, possibly more efficient model; etc.



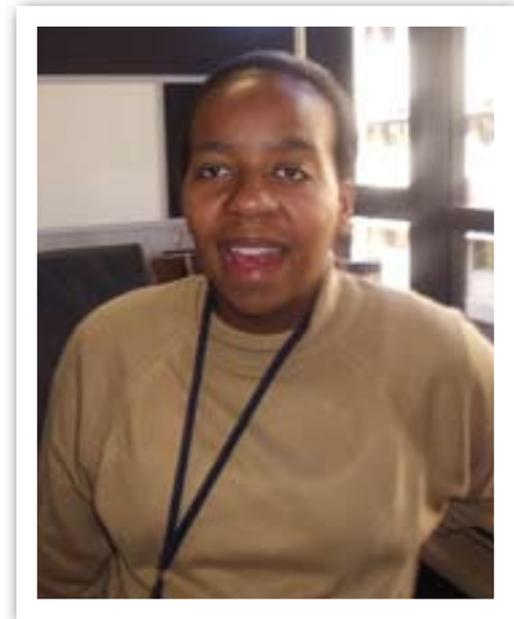
No conflicts of interest were posed by the appointment of any or all of the proposed Study Panel members as they were required to submit written Conflict of Interest statements. This will also be applied to the Reference Group members, once appointed, and all participants will be bound to report any new potential sources of conflict of interest during the study.

In the end, the list of Study Panelists (table below) departed from the draft guidelines in that a larger Panel was constituted (14 members) rather than the recommended 10 members or less. At the suggestion of the ASSAf Council, a Reference Group will be proposed to support and monitor the Study Panel's work with a special focus on the social, cultural and economic aspects of the issues under study, as well as of the recommendations to be made. The Study Panel will also use a set of international and national authorities as advisors and consultants.

The first meeting for the study was held on 28 October 2005. Professor Barry Mendelow (MASSAf) was unanimously supported by all Panel members present to be recommended for appointment as the Chairperson of the Panel. This appointment was confirmed by the ASSAf Council. Initially Dr Liesl Grobler acted as part-time study director and researcher for the study. Late in 2005, two Assistant Projects Officers were appointed – Ms Boitumelo Mabina now serves as the Study Director, while Ms Rudzani Ramaite serves as understudy for capacity-building purposes. Dr Xola Mati (Projects Director) manages the project as a whole.

**Approach to the Study:** The Study Panel guided by the Chairperson, Prof Barry Mendelow (MASSAf), is using a range of methodologies that meet the brief provided by the ASSAf Council. These include the following:

- Hiring of researchers to address sub-topics and help provide draft sections of the Report.
- Holding a public workshop with invited speakers and/or panel discussions.
- Holding Panel workshops to debate and resolve particular questions and issues.
- Delegating initial analysis of topics of the study to individual members or sub-groups of the Panel.
- Any other ways of working towards a proper understanding of the evidence and information that can



■ **Ms Boitumelo Mabina**

ASSAf Projects Officer and Consensus Study Director



*The **outcome of the study** should provide clear guidance on the key issues, and a set of recommendations that are based on the best evidence.*

*The **Consensus Report**: The brief of the Study Panel is to examine the most relevant and reliable evidence that has a bearing on the following issues, and to make recommendations based on that evidence that is the most appropriate and feasible.*

help to complete the study, including a web-based invitation to submit inputs on topics thought by the Panel to be particularly problematic.

The **outcome of the study** should provide clear guidance on the key issues, and a set of recommendations that are based on the best evidence and the most integrated understanding of the ways in which nutrition affects people suffering from infections such as tuberculosis and HIV-caused immunodeficiency conditions.

**The Consensus Report:** The brief of the Study Panel is to examine the most relevant and reliable evidence that has a bearing on the following issues, and to make recommendations based on that evidence that is the most appropriate and feasible:

- Nutritional modulation of the normal human immune system (innate and adaptive, at different ages, in both sexes, over short or long periods) with respect both to general under-nutrition (macronutrients) and to specific deficiencies of micronutrients.
- Modulation of human nutritional status in states of infection, both acute and chronic, with special emphasis on infection with M.tuberculosis (Mtb) and the human immunodeficiency virus (HIV).
- Effects of nutritional interventions on morbidity and mortality in adults and children infected with HIV or suffering from clinical tuberculosis, or both.

The ASSAf Consensus Study does not duplicate high-quality work already done in the field by others, nor adds to public confusion in the area. The following are distinctive features of the kind of report the Academy will produce, and the unique benefits it will provide:

- The study will be carried out independently by the selected group of eminent professionals who bring a variety of disciplinary insights and conceptual strengths to the topics to be examined.
- Both tuberculosis and HIV infections are to be studied, separately and as conditions that frequently co-exist, against a background of a general, evidence-based understanding of the functional inter-relationships between infection and nutrition.
- More attention will be given to the functioning of the immune system in relation to nutritional factors, than has been the case in other reviews and reports.



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- Specificity related to genetic and individually applicable developmental factors will be thoroughly explored and interpreted in relation to generally applicable human responses.
- The study will be rooted in the national context; and the report on the study, while strong in reviewing and evaluating all the available, reliable scientific evidence, will be written in very clear, non-technical language so that it will be useful to a broad range of users. (The reporting model established by the US National Academies for its extensive set of consensus studies will be prototypical, based as it is on a very impressive track record of effective intervention on topics of national importance in that country and beyond.)

**The Expected Impact of the Study:** The main tangible output of the proposed study will be an authoritative ASSAf Report published in the public domain but presented in an appropriate way to the Ministry and Department of Health and to the various provincial health departments. The main conclusions and recommendations will be summarised in a readable and useful form. The document will be one that can also be made available to teaching and training institutions to influence the content and approach of their programmes and to the media in order to reach the broad mass of the public to help with infection prevention and health promotion. The ASSAf Report is expected to influence public policy in the area of prevention, support and therapy of the pandemic infections now current (such as Mtb and HIV), and to achieve the anticipated benefits through provision of clear guidelines inter alia for the following:

- The conduct of trials to assess the efficacy of nutritional interventions in HIV- and/or Mtb-infected individuals.
- The use of general and specific nutritional interventions in preventing, controlling and ameliorating the effects of infections on their hosts.
- Cost-effective planning and resourcing of appropriate support measures for infected individuals and communities in meeting their nutritional requirements.
- Programmes of public health education, and partnerships with industry in employee support.
- The production/processing of foods and nutritional supplements.

### ***The Expected Impact of the Study:***

*The main tangible output of the proposed study will be an authoritative ASSAf Report published in the public domain but presented in an appropriate way to the Ministry and Department of Health and to the various provincial health departments.*

*The urban environmental sustainability programme is designed to engage the broadly-defined leadership of cities, local scientists and engineers, and mobilise world-class scientific and technical expertise in a broad partnership that will act in selected locations to address environmental challenges and opportunities in rapidly growing urban regions.*

## *Working towards more sustainable cities*

The report will accordingly be written to maximise its impact on the resolution of controversy in this area, on improved health-service planning and purposeful resourcing, and the general promotion of national cohesion in addressing the pandemic infections. It will aim to be decisive in achieving a much-needed turn-around of a critical national success factor, the health of our youth and of our economically active people, and the preservation of families as the social core of the nation. The projected time to conclude and publish the report is one year with four to five full Panel meetings and the possibility of an open/public workshop to enhance the study. The length of the report is envisaged to be  $\pm 200$  pages, comprising 10 chapters of about 20 pages each. A brief version of the report ( $\pm 20$ ) will also be published for broad dissemination.

### *Evolving Consensus Study: US National Academies' Urban Environmental Sustainability Programme*

The US National Academies and a number of international partners are submitting a proposal to the Gordon and Betty Moore Foundation that will fall within the National Academies' urban environmental sustainability programme. A complementary proposal is being prepared by the University of California at Berkeley and several partners. The urban environmental sustainability programme is designed to engage the broadly-defined leadership of cities, local scientists and engineers, and mobilise world-class scientific and technical expertise in a broad partnership that will act in selected locations to address environmental challenges and opportunities in rapidly growing urban regions.

The programme is envisioned as spanning at least a decade, ultimately involving dozens of cities in many countries. Specific programme elements are designed to engage with municipal governments, academic and technical organisations, as well as key urban planners at the local level; with national academies of science and engineering, government ministries and key national policy makers at the national level; and with outstanding urban scholars, engineers and policy experts at the global level, as cities share their experience and knowledge resources.



## *Science-based approaches to the alleviation of poverty*

The programme aims to help solve urgent urban problems, reduce the environmental impact of human actions associated with urbanisation, and build enduring local capacity through a process that incorporates collaborative action-oriented activities. The latter include elements that have proved successful previously in working with international partners as well as elements that will be innovative and experimental.

In South Africa, the programme will be able to take advantage of strong ties that the US National Academies have with the Academy of Science of South Africa (ASSAf). ASSAf is an initial intensive partner in the broad and systematic ten-year initiative to build the capacity of African academies of science so that they can provide their own independent scientific and technical policy advice to their governments. ASSAf and the **South African Academy of Engineering (SAAE)** are working together to develop country-specific proposals for submission to the Gordon and Betty Moore Foundation, and are in the process of setting up a steering committee to focus the programme, if funded, on the city of Cape Town.

### *Forum-type Convened Studies: Science-based approaches to the alleviation of poverty*

The Academy of Science of South Africa (ASSAf) approached the Department of Science and Technology (DST) of the South African Government, indicating that the Academy was keen to be asked to investigate important science-based issues as built into the Academy constitution and statute. The Director-General and senior colleagues from the DST leadership proposed that ASSAf should undertake a “Forum-type” study on science-based approaches to the alleviation of poverty in South Africa, a task which needs a spread of high-level expertise and thorough experience to

- identify the most promising sub-topics of the study;
- develop the most productive and feasible approaches to each of these sub-topics, and
- draw in the most suitable people from inside and outside the country who could play specific roles in the studies concerned.



■ **Ms Rudzani Ramaite**

ASSAf Projects Officer and Forum Study Director



**Prof Sagadevan Mundree** (MASSAf)  
Chairperson of the ASSAf Committee  
on Science for the Alleviation of Poverty

The ASSAf Council accepted the invitation, but reflected on how the Academy could best contribute to one of the five new National Missions outlined in the country's R&D Strategy accepted by the Cabinet in 2005 and entitled: "Science and technology for the alleviation/ reduction of poverty".

It was decided that ASSAf would first create a new internal structure within the Academy – of the kind known as "Boards for X (or Y)" in the US National Academies system – to enable a well-informed, multi-disciplinary sub-set of Academy members to examine the issues and develop proposals for the conduct of either Consensus or Forum-type Studies within their brief. The establishment of the first internal structure would then act as a pilot of further developments along the same lines. The structure was to be called the "**Committee on Science for Poverty Alleviation**" and was to be multi-disciplinary and inclusive in its composition and functioning.

In the National R&D Strategy, the suggestion had been that at least R150 million a year should be set aside for the support of research that would materially reduce and alleviate poverty. The ASSAf Council felt the matter could be addressed as a possible mega-theme analogous to the microbial threats theme

### ASSAf Committee on Science for the Alleviation of Poverty

Name	Organisation
<b>Prof Sagadevan Mundree</b> (MASSAf) (Chair)	Plantbio and University of Cape Town
<b>Ms Ann Bernstein</b> (MASSAf)	Centre for Development and Enterprise
<b>Prof Dan Ncayiyana</b> (MASSAf)	The South African Medical Journal
<b>Prof Dave Dewar</b> (MASSAf)	University of Cape Town
<b>Dr Mamphela Ramphela</b> (MASSAf)	Circle Capital Ventures
<b>Prof Priscilla Reddy</b> (MASSAf)	South African Medical Research Council
<b>Prof Renfrew Christie</b> (MASSAf)	University of the Western Cape
<b>Prof Solly Benatar</b> (MASSAf)	University of Cape Town



that the US National Academies have developed. The present committee was constituted by invitation to ASSAf members to advise the Council of the Academy on “what are the topics that should/could be looked at in detail or what could be explored”. The Committee would not be an active participant in organising forum-type workshops or conducting other parts of the studies themselves, but would recommend the most suitable sub-topics and monitor overall progress.

The new Committee was to be formed by inviting all ASSAf members to consider whether they would be willing to serve as one of approximately eight committee members for a 3-year term. If more than eight volunteered their services, a simple election would be held, with the Academy as a whole voting on the basis of short citations for each candidate. Once elected, the new Committee would be asked to address the ways by which the request from the DST might be met by the Academy, using ASSAf’s adopted policy (“Guidelines for requested Studies by ASSAf”). The further processes would then proceed under the general supervision of the Committee, reporting to the Council itself. A total of eight ASSAf members eventually volunteered to serve on the committee. They can be augmented by other persons from within or outside the Academy, as needed, on recommendation to the Council. The committee members represent a wide and balanced cross-section of expertise, interests and experience, with good coverage of the key areas relevant to the alleviation of poverty. The committee was thus formed on a basis that capitalises on the Academy’s multi-disciplinary nature and aligns the internal structures with broad areas of Academy focus.

**Functioning of the committee and progress to date:** The Academy Committee was set up to drive what are called “Forum-type Studies” in an important and broad area of national concern. The ASSAf design/methodology to be adopted for such Committees is modelled on the entity which in the US National Academies is referred to as a “Board for XXX”, utilising two different approaches to generating helpful advice to the nation. The role of committee members is essentially to help the Academy identify and develop topics, to point things in the right direction, to get things going, and then to keep a watching eye. The 8-member ASSAf committee on “Science for the alleviation of poverty” held its first meeting



Image: Quest – Science for South Africa



on 15 March 2006. The meeting was well attended by a total of nine people, five of eight committee members and four ASSAf staff members, attending as support staff. The main objective of the meeting was to introduce the committee to the forum-type study with reference to studies already done in USNA. Background materials were tabled and some handed out at the meeting, including reports from forum-type studies already undertaken in USNA and other reports on the state of poverty in South Africa.

A **Committee chair** (Prof Sagadevan Mundree (MASSAf)) who will drive the work of the Committee, was appointed by the ASSAf Council. The support staff for the study is Dr Xola Mati, Ms Rudzani Ramaite (Study director), Ms Boitumelo Mabina and Prof Wieland Gevers (MASSAf). The study director as assigned to the project does all the detailed work in terms of arranging meetings and looking at follow-up activities. The committee agreed to convene a consultative workshop (forum) on government policy coordination in respect of the alleviation of poverty. The workshop will be well informed by prior or live inputs of various kinds from the best available experts and from the relevant departments themselves. The committee will also hold workshops on other identified topics and publish them in the name of the Academy as the best consensus that can be reached. Such identified topics will either be addressed as Consensus Studies, if approved under policy by the Council, or as draft Public Statements on specific topics.

### *National consultative symposia: "Double Symposium on Evidence-based Advice"*

The ASSAf Council decided that the Academy should hold a major "double symposium" on evidence-based advice to government. This took place in the CSIR Conference Centre, Meiring Naude Road, Pretoria on Friday, 3 March 2006. The Symposium was divided into two sessions:

- **Symposium 1** (morning, organised by Prof Jonathan Jansen (MASSAf))
- **Symposium 2** (late morning-afternoon, organised by Prof Wieland Gevers (MASSAf) and Dr Xola Mati).

The first and second invitation circulars with early registration forms were sent to a large number of invitees to ensure the participation of many senior government officials and other policy makers in



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In addition to representatives from academia, business, non-governmental organisations, delegates from other African Academies within the African Science Academies Development Initiative (ASADI), as well as the media and the general public. The Minister of Science and Technology not only accepted the invitation to officially open the “Double Symposium” but participated in the deliberations, while the Deputy Minister of Health also attended and participated throughout.

ASSAf’s Action Plan for Year One of the USNA partnership included an “Open-house” function hosted by the Academy for senior representatives of many relevant government departments and other stakeholders. The aim was to present and discuss ASSAf’s role in generating and providing science-based advice for South Africa. The ASSAf Council resolved to cancel plans for its customary annual AGM-linked Symposium in 2005 in favour of a one-day double symposium on the nature of evidence (Symposium 1: “What is Evidence?” and Symposium 2: “Science-based advice for the nation”). The event served the double purpose of expanding the scope of the symposium programme, and providing an opportunity for exploring ASSAf’s potential role in the national science system as an independent, authoritative, preferred provider of evidence-based advice on a broad range of nationally significant topics and issues. Experience in the roll-out of the USNA-funded programme underlined the urgency and strategic importance of making ASSAf’s activities better known and understood in the leadership structures of government departments and other organisations.

**The goal of the Symposium** was to bring South African scientists and national policy makers together for a dialogue on the potential role of science academies in supporting government decision making. This would be done by providing opportunities for relationship building, networking and shared learning on the potential for evidence-based advice to inform South Africa’s most significant public policy challenges.

Overall, a total of 108 people attended the Double Symposium:

- 18 from Government Departments (DST, DoE, DoH, DoA)
- 36 from Universities (UP, UCT, UNISA, UNIVEN, TUT)
- 26 from Science Councils (CSIR, SAASTA, CHE, HSRC)



■ **Prof Jonathan Jansen**

ASSAf Vice-President and Organiser of Symposium 1



### ■ Prof Les Irwig

International speaker from the University of Sydney, Australia, on the ASSAf Double Symposium

■ 14 from Science Academies (ASSAf, SAAE, USNA, Kenya)

■ 14 from the private sector

Four international speakers were invited to the Double Symposium (Prof Les Irwig, University of Sydney, Australia; Prof Michael Clegg, Foreign Secretary of the US National Academies; Prof Jeffrey Koplan, Woodruff Health Sciences Centre; and Prof Ann Dowling, Cambridge University).

Throughout the Double Symposium, the planned scribe and tape-recording process of the proceedings were in place with a view to the publication of the Symposium proceedings. (An editor had been hired to edit and oversee such publication.)

After the Symposium, an evaluation form was sent to each of the people who attended the Symposium. The form was divided into three parts, of which the first two mainly served to evaluate the Academy's success in reaching the Symposium objectives and the quality of the Symposium. The last part required background information from the person filling in the form so as to establish whether he/she was from government, the private sector, an academy, university, etc.

Respondents gave positive feedback, emphasising that they considered the Symposium to have been very fruitful.

Christina Scott, an award-winning science journalist and author who writes for the London-based Science and Development Network (online at [www.scidev.net](http://www.scidev.net)) wrote a press/media release to disseminate information about the ASSAf "Double Symposium" and on the best ways to generate evidence-based advice to government and the nation at large. The press/media campaign was published by the London-based Science and Development Network, the Cape Times, Natal Witness, Pretoria News and the SABC News Radio programme.

The Proceedings Report will shortly be printed in an edition of 2 000 and be distributed as follows:

■ The Minister of Science and Technology and Minister of Education, their Directors-General and all their Deputy Directors-General will each receive a copy of the Proceedings Report, plus extra copies for in-house use. Each of the Ministers and Directors-General of Agriculture; Health; Communications; Environmental Affairs and Tourism; National Treasury; Trade and Industry will receive a copy, as well as



the Parliamentary Portfolio Committees corresponding to all the relevant departments as stated above.

- Copies of the Proceedings Report will be sent to the Chief Executive Officers and Chairpersons of Higher Education South Africa (HESA), the Council on Higher Education (CHE), the National Advisory Council on Innovation (NACI) and the National Science and Technology Forum (NSTF).
- Each of the 261 members of the Academy will receive a copy of the Proceedings Report. About three copies will be sent to each of the sister academies in Africa (Nigeria, Kenya, Senegal, Madagascar, Ghana, Cameroon, Uganda, Zimbabwe, Zambia, Tanzania, Egypt, AAS) and to academy-like bodies in other African countries such as Namibia, Botswana and others. Copies of the Proceedings Report will be also sent to TWAS, the ICSU main and Africa office, the NEPAD S&T Secretariat, the IAP, and other international bodies linked to ASSAf. International dissemination included the US National Academies and selected individuals in the USNA-ASSAf partnership; the Royal Society; the Russian Academy of Sciences, the national science academies of India, Brazil, Mexico, Chile, France and selected others. Copies of the Proceedings Report will be sent to each of the “deposit libraries” (State National Library branches, Parliamentary Library, Constitutional Court, and other).
- Sets of copies of the Proceedings Report (about 25) will be sent to the Vice-Chancellors or equivalents of each of the 21 South African universities, technikons or universities of technology, with the request to be distributed among Deputy Vice-Chancellors or Vice-Rectors, Deans and Librarians. Sets of copies (about 15) will be sent to the Presidents or Chief Executive Officers of each of the 11 South African science councils or equivalents, with the request that they be appropriately distributed within their organisations. Where the need arises, extra copies of the Proceedings Report will be printed.

### *Training of ASSAf staff for the planned Academy development programme through a visit to the US National Academies by two ASSAf Project staff members – October 2005*

One of the key items in the Year One Workplan was a visit by two members of the ASSAf projects staff to the US National Academies, mainly to attend a Forum meeting but also to meet and network with



#### ■ On the Symposium

Mr Mosibudi Mangena, Minister of Science and Technology and Prof Robin Crewe, President of ASSAf

## *Promoting South African Science and Technology capacities for the 21st century*



### ■ Dr Barney Cohen

Country Director for South Africa on the USNA/  
ASADI partnership

programme staff in various relevant divisions. The visit, which involved Dr Xola Mati and Ms Boitumelo Mabina, was facilitated by the Country Director for South Africa, Dr Barney Cohen, and inter alia included interactions with the following persons:

- Meeting with the USNA-ASADI partnership programme staff and other programme staff, as well as a ASADI Board chairperson, Enriqueta Bond, who welcomed the visiting delegations from Nigeria (a Council member and new Programme Officer); Uganda (a Council member, new Executive Secretary and Programme Officer); and South Africa.
- Richard Bissel, Executive Director of the USNA partnership programmes, outlined some examples of a number of other partnership programmes that the USNA has undertaken over the years, both at national and regional or continental levels.
- Patrick Kelley, Executive Director of the Board on Global Partnership and Board on African Science Academy Partnership Development (BASAD), suggested that achievement of the millennium development goals in African science should be a focal development area".
- Eileen Chaffness, the Study Director of the Forum on Microbial Threats, outlined what she does in her role as a forum director, how the forum was constituted, and how it functioned.
- Carol Heilmann, who represents government as the Director of Health in the US Department of Health and Welfare, shared her experience as a member specifically of the Forum on Microbial Threats, while Stanley Lemon, who is from the academic sector and also the Chairperson of the Forum on Microbial Threats, elucidated his role as the chairman of that Forum.
- Stephen Brickner, from the private sector as the Director of Pfizer Pharmaceuticals, which together with other companies co-funds the Forum on Microbial Threats, gave perspectives based on his role as a member of the same Forum.
- Nancy Carter-Foster, who also represents government as the Senior Policy Advisor to the Health and Welfare Secretary in the US, shared her experience as a member of the Forum on Microbial Threats.
- The ASSAf delegation had a final meeting with Mary Ellen O'Connell about ASSAf's planned double



symposium on evidence-based advice, and capacity-building between the social, economic and human sciences.

### *First Annual Collaborative Workshop and Conference of ASADI in Nairobi, Kenya from 6–10 November 2005*

An important part of the ten-year project operated by the US National Academies and involving seven funded African Science Academies (and more recently, several fledgling African Science Academies that are not yet funded) is an annual conference on a specific topic. The first such event held in Nairobi, Kenya in early November 2005 and hosted by the Kenyan National Academy of Sciences, consisted of a first day of joint and executive sessions involving the Network of African Science Academies (NASAC) and the Board on African Science Academies Development (BASAD). These respectively provided the US National Academies and African Academy leaders an opportunity for face-to-face networking as part of a planned project and institutional development process. This was followed on the second and third day by a public conference that focused on

- the use of science and technology in improving policy decision making in a broad area of need,
- the achievement in African countries of the United Nations' **Millenium Development Goals** (MDGs),
- establishing and building long-term partnerships;
- strengthening communication and collaboration among the participating African science academies, and especially
- convincing the many government and business delegates that science academies can be useful to them in solving the range of national and continental problems that are preventing the achievement of some or all of the MDGs.

The final two days were taken up with a **learning collaborative involving African science academy leaders and staff** with specific training opportunities in essential academy-type developmental activities, including strategic planning, budgeting and financial management, the identification and cultivation of



*The Academy of Science of South Africa is constituted to ensure that leading scientists, acting in concert and across disciplines can promote the advancement of the application of Science to the problems and challenges facing South Africa*

stakeholders, fund raising and media connections.

The opportunity to facilitate input by all participating African science academies in advance in the design of future meeting programmes (i.e. to plan the scientific programme, decide on the conference format, choose a suitable learning collaborative program and prioritise speakers) helped to provide a sense of ownership of the process, and should be built on when future meetings are planned. This is a major developmental opportunity for the African science academies collectively and increasingly to manage the participation of policy makers, media representatives and academy representatives from each of their countries.

### *Communication within, and from outside ASSAf, and linkages in Africa*

#### *The ASSAf Website*

The Academy's website ([www.assaf.org.za](http://www.assaf.org.za)) was using the domain "co.za" instead of the more appropriate term of "org.za" because the maintenance of the site has been outsourced to a for-profit company called SABINET Online. The website will soon undergo a total revamp and has acquired an address using "org.za". A secure site for ASSAf members will be opened for confidential communication with members and Council members in connection with documents of annual membership and biennial Council elections, nominations for ASSAf Awards and other matters.

Hyperlinks will be provided to the websites of other African Academies, the South African Academy of Engineering (SAAE), the US National Academies, NASAC and other African science academies, the National Advisory Council on Innovation (NACI), the InterAcademy Panel (IAP), the InterAcademy Council (IAC), the Academy of Sciences of the Developing World (TWAS), and SciDev.net.

ASSAf Members are encouraged to visit the site regularly to keep track of ASSAf news and activities, standing items such as the ASSAf Act, the ASSAf Constitution, the quarterly Newsletter, all ASSAf policies and guidelines, ASSAf public statements, press releases, the portals of the ASSAf publications



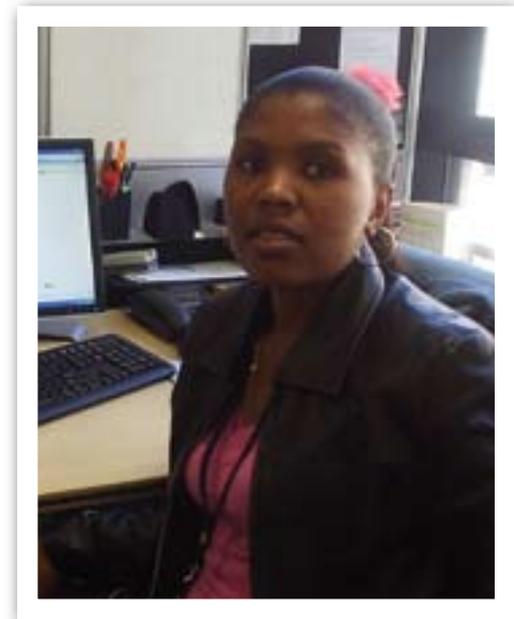
(*South African Journal of Science* and *Quest – Science for South Africa*) and contact details of all office bearers and other ASSAf Council members and members. The ASSAf website will be a primary channel for public participation in ASSAf studies and forums.

### *The ASSAf General Register of Members*

The Academy of Science of South Africa, as one of the national science academies in Africa, was awarded USD 3 300 by the InterAcademy Panel (IAP) and the Academy of Science of the Developing World (TWAS), from funds made available for developmental projects. The ASSAf Council carefully considered how these funds could best be utilised to promote the Academy's development and facilitate its work. A project that was long overdue and that would make a very significant difference was the production of ASSAf's first General Register of Members, to exist in both print and electronic versions, and provide essential details of all ASSAf Members for the following purposes:

- Identification of specific areas of ASSAf expertise by other African Science Academies and those further afield.
- Facilitation of contact between ASSAf members and the members/fellows of other African science academies, as well as of academies and organisations abroad.
- Branding of ASSAf as South Africa's premier reservoir of high-level, multi-disciplinary scientific expertise committed to the application of scientific thinking in the service of society.
- Creation of aspiration among younger scholars to achieve membership of the Academy.

The Register, in addition to providing photographs and contact details of all ASSAf members, would also contain the ASSAf Act, the ASSAf Constitution and existing policies for elections, awards, fellowships and the like. We have to date received over 150 ASSAf register entries from ASSAf's 261 members, and intend to hasten the finalisation of data collection by placing the electronic version of the (incomplete) Register of Members on the ASSAf website in alphabetical order, adding the outstanding names and details in batches as they arrive. The print version of the General Register will only be published when



■ **Ms Khanya Ledwaba**

Administration Officer: Membership

the list is complete or near-complete, which is expected to be before July 2006. The Register will be widely circulated to all South African government departments, science councils, higher education institutions, museums, etc. Copies will also be sent to all African national science academies, IAP/IAC, TWAS and ASSAf partner science academies generally. The Register will be updated and re-published at least once every three years.

#### *The ASSAf Members' Newsletter*

Since its existence, the Academy has always communicated with its members through the constitutionally mandated circulation of the minutes of Council and Annual General Meetings, explaining and giving brief details of the main topics discussed and decisions reached. A number of matters were dealt with through ad hoc direct communication. In order to meet the obvious need for a more informative and involving supplementary way of effectively communicating ASSAf matters with all its members, it was decided to establish a quarterly Members' Newsletter, the first issue appearing in November 2006. This is intended to convey information succinctly and clearly to all ASSAf members, while giving them an opportunity to correspond with ASSAf officers and give inputs or make suggestions whenever they feel this is necessary. Hard copies of the Newsletter are sent to all members by post and it is posted on the ASSAf website. The editors of the Newsletter are Prof Wieland Gevers (MASSAf) (ASSAf Executive Officer) and Ms Rudzani Ramaite (ASSAf Projects Officer). In future there will be a second, public version of the Newsletter for systematic distribution to ASSAf stakeholders.

#### *Press and media relations*

Ms Christina Scott, an award-winning science journalist and author who writes for the London-based Science and Development Network, online at [www.scidev.net](http://www.scidev.net), designed a press/media campaign to disseminate information about the ASSAf "Double Symposium" on the best ways to generate evidence-based advice to government and the nation at large. The press/media campaign led to favourable reports





- increasing the representation of disciplines such as agricultural science in the membership (work also in progress);
- enhancing cooperation with the Department of Education in promoting the use of *Quest* magazine (being negotiated);
- completing by 31 March 2006, the 2001-4 research publishing study originally funded by the Department (done); and
- ensuring that, for coordination purposes, the Department had sight of ASSAf's annual workplans under the US National Academies partnership (done).

#### *General impact of the South African ASADI programme*

Qualitatively, one can report that the impact of the USNA-ASSAf partnership on the Academy has been enormous. The momentum given to the Academy's previously problematically slow trajectory can be seen by comparing the number of staff employed (4 at beginning of 2005; 10-11 in mid-2006). It is also clear from the greatly increased volume of activity and pressure of work; the drawing in of ASSAf members into its evolving work programme; the much broader realisation of ASSAf's position as the country's national science academy; wide recognition internationally through partnering the world's largest and most active science academy system, the US National Academies; publication of the first major national advisory report; organisation of an international symposium on evidence-based advice; setting up of new internal structures to facilitate ASSAf's future work; and a beginning alliance fashioned with the South African Academy of Engineering. The further impact of these developments on ASSAf in the following years of the ASADI project will be considerable and, more importantly, so will be the impact of ASSAf on the welfare and progress of South Africa.

#### *List of top five accomplishments in Year One*

- Setting up the first ASSAf Consensus Study Panel for examining a highly topical issue in the health



domain – due for Report completion by the end of 2006.

- Holding a major international (double) symposium on evidence-based advice to government and the nation – Proceedings to be published later in 2006.
- Setting up ASSAf's first topical/area "Board" (in our case called a "Committee") to oversee a broad study of selected topics in the use of science to alleviate poverty in South Africa.
- Recruiting a team of ASSAf staffers with clear job descriptions, training plans and potential for development as "academy-type professionals".
- Production of a major national report on research publishing in South Africa, with strong and feasible recommendations for improving the nation's capacity for and contribution to high-quality scholarship and research.

### *Monitoring and Evaluation of the USNA-ASSAf partnership project*

The Memorandum of Understanding (MoU) between the Academy of Science of South Africa (ASSAf) and the United States National Academy of Science (USNA) signed in 2005 specified that ASSAf and USNA would participate in both a five-year and a ten-year independent, external evaluation of the USNA-funded project and commit to the collection and management of data necessary for the evaluation.

The first Annual International Conference of the African Science Academy Development Initiative (ASADI) was held from 7 to 10 November 2005 at the Intercontinental Hotel in Nairobi, Kenya. At the learning collaborative part of this meeting, African Academies were introduced to monitoring and evaluation processes through presentations and discussions by external, independent monitoring and evaluation experts, Donna Podems and Natasha Nel. They gave a presentation on monitoring and evaluation, which included a brief introduction, discussion on monitoring and evaluation terms, group discussions, plenary reflection and a post-training feedback survey. At the same meeting it was agreed that the appointed independent monitoring and evaluation team (Evaluation Team) would visit each individual Academy early in 2006 to collect baseline data from their identified stakeholders.

ASSAf identified a total of 15 stakeholders, based in both Gauteng and Cape Town, to be interviewed by this Evaluation Team. The identified stakeholders included people internal and external to the organisation, in the following categories:

- 4 ASSAf members
- 5 general stakeholders
- 6 ASSAf members / general stakeholders

The Evaluation Team chose January 2006 to collect baseline data from ASSAf and its stakeholders. Two people from the Evaluation Team, Ms Donna Podems and Ms Kerstin Rausch (both from OtherWise) visited ASSAf from 17–19 January 2006, to conduct interviews with stakeholders in and around Gauteng Province, mostly Pretoria. On 16 and 20 January, and again on 15 March; the Evaluation Team conducted interviews in Cape Town, mainly with Cape Town-based ASSAf stakeholders. During this period, the Evaluation Team collected baseline data regarding ASSAf’s programme in order to compile a baseline data report intended to be used for the Year 4 formative evaluation and the Year 10 summative evaluation processes.

**ASSAf staff training:** On 19 January 2006 seven ASSAf staff members attended a day’s training session on monitoring and evaluation presented by the Evaluation Team. The aim was to provide them with a basic understanding of monitoring and evaluation concepts, to start unpacking ASSAf’s programme logic and assumptions, as well as developing the Academy’s monitoring framework, while providing the milestones that the Academy intends to achieve in the coming years.

ASSAf staff members worked with the Evaluation Team and begin to develop their own monitoring and evaluation framework as well as give their own practical examples.

**General outcomes and recommendations:** The Evaluation Team conducted all baseline data collection interviews and observations with ASSAf stakeholders in Pretoria, Johannesburg and Cape Town. A utility focus guided the Evaluation Team in the baseline study’s design and implementation. They used qualitative methods to gather data, including formal and informal interviews, focus groups, document reviews, and observation.



## *An Academy of Science that is a unique contributor to national and continental development*

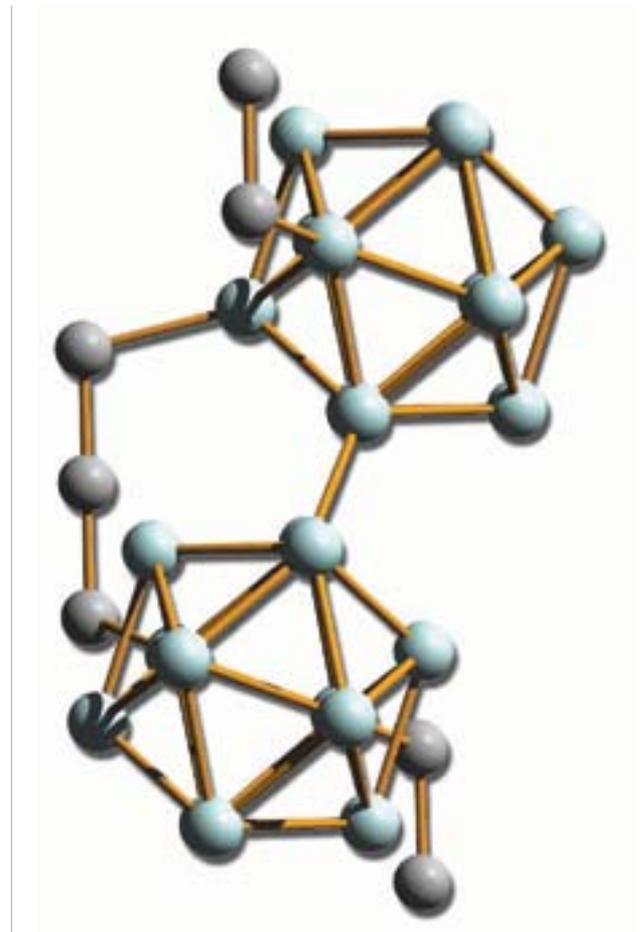
The Evaluation Team interviewed people internal and external to the Academy. Internally the interview focused on three main areas:

- Description of the Academy
- Financial Sustainability and Human Resources
- Activities

Externally the interview concentrated on two main questions, namely each stakeholder's perception of the Academy and his/her expectations for the Academy over the next four years. The monitoring and evaluation team (M&E Team) emphasised the importance of the internal data collected over the years, specifying that the data would provide not only help to ASSAf in continually monitoring and improving its programme, but also information for the mid-term and impact assessment.

**General monitoring and evaluation suggestions:** The following were listed by the Evaluation Team as suggestions in the development of the monitoring and evaluation system:

- The monitoring and evaluation plan should support the strategic and work plans.
- Not everything should be monitored – only key assumptions, and those vital to the programme implementation.
- One ASSAf staff member should be responsible for the monitoring and evaluation plan.
- It is important to remember that the monitoring and evaluation plan is a management tool, its intent being to ensure the success of the programme results.
- All staff should be involved in order to develop a solid monitoring and evaluation plan.
- ASSAf should revisit the indicators and ensure that they directly measure their objectives/intended results.
- Theory-in-use is not based on fact but on each person's own theory of how the intervention will work. In the first visit the theory-in-use and related assumptions were not clear. During the second site visit, it would be useful to work with the entire Academy staff to discuss their theory-in-use, related assumptions, and programme logic.



**Implementation of the evaluation process:** ASSAf recently held a Double Symposium on evidence-based advice (see 3.7). The goal of the Symposium was to bring South African scientists and national policy makers together for a dialogue on the potential role of science academies in supporting government decision making. The Symposium was aimed to provide opportunities for relationship building, networking and shared learning on the potential for evidence-based advice to inform South Africa's most significant public policy challenges. To evaluate success towards achieving its goals in the Symposium, evaluation forms were handed out to those who attended in order to obtain useful guidance on shortcomings of the approach. A similar evaluation form was handed out during an IAP-supported international workshop on science teacher education organised in Gauteng by ASSAf staff. ASSAf has thus begun to implement monitoring and evaluation systems in its activities.

Ms Rudzani Ramaite is the designated monitoring and evaluation officer within ASSAf, reporting to Dr Xola Mati as Projects Director and Prof Wieland Gevers (MASSAf) as Executive Officer.

### *Lessons learned, and recommendations to other ASADI participant African science academies*

The first year of the ASADI partnership has brought home the following:

- Careful attention has to be given to the balance between an Academy (as reflected by its senior scholarly membership/fellowship, together with its official governance organ, the Council) on the one hand, and the Academy office (with its Executive Officer, Projects/Programmes staff and other officers fulfilling a variety of essential functions) on the other. Enthusiastic and capable staff may succeed in driving the Academy agenda and business, and are indispensable for success, but the Council (office-bearers) and Academy members/fellows must play a very active leading role for the *raison d'être* of an Academy's niche in a country's science system to be realised. Real authority flows from the independence, the high scholarly quality and the multi-disciplinarity of an Academy, and can therefore be successfully and legitimately applied to addressing national problems. Fostering a good balance between office effort and the broad "Academy" is a fundamental requirement.



- Key questions that come up in a young academy, or better an academy that is starting up in the late 20th/early 21st century, is that some assumptions one may make by analogy with older academies do not necessarily apply. For example, the principle of voluntary and “honorary” service to an Academy by its members/fellows, or by outside scholars, cannot be taken for granted, as many academics now participate in the consultancy marketplace as actively as do private sector participants, and the opportunity cost of working on an academy study may be quite considerable. Academy prestige and associated prioritisation are the key to managing this issue, but other approaches may be needed without departing from the fundamental principles that govern the intrinsic value of academy-type contributions to a country’s life and welfare.
- A good track record is the best guarantor of future success – an academy is not valued in a competitive environment simply for its existence.
- An academy needs to ensure that its national role is established before extensive international activities are undertaken. Many advantages will, however, accrue from judicious use of such linkages where these bring real mutual benefits. The ASADI programme must recognise that an association of strong individual national academies will be far more productive than an ambitious and/or strongly driven association of weak academies.

### *Other sources of project support*

In the past (i.e. before the initiation of the ASADI partnership with the US National Academies) ASSAf relied mainly for its operations on an annual Grant-in-Aid from the Department of Science and Technology (DST). Part of the funding provided by the DST constituted a three-year (2002-4) contract for the Research Journals project comprising the subsidisation of the *South African Journal of Science* (SAJS), *Quest – Science for South Africa*, and the consensus Study on Research Publishing in South Africa (described above), amounting to over ZAR 4,5 million. The level of Grant-in-Aid support increased in the last two years to the point where the awarded operational funds (distinct from continuing support for the SAJS and *Quest* at about ZAR 1,1 million) now stand at about ZAR 2,1 million for the financial year 2006-7

### Key performance indicators for Programme 3

ASSAf's international activities have expanded dramatically in the last year, linked to internal growth and the development of its capacity to function as South Africa's national science academy in the fullest sense. The partnership with the US National Academies in conjunction with the Network of African Science Academies (NASAC) has allowed the Academy to initiate a major consensus study on nutrition and human immunity, to establish a Committee on Science for the Alleviation of Poverty, and to convene an outstandingly successful international "double symposium" on evidence-based advice.

ASSAf is participating in various programmes of the InterAcademy Panel (IAP), is awarding a Young Scientist Prize in conjunction with the Academy of Science for the Developing World (TWAS), and has been able to secure the election of one of its members as the co-chair of the InterAcademy Medical Panel (IAMP).

(the total Grant-in-Aid for 2006-7 is ZAR 3 million).

ASSAf has had support from the Andrew W Mellon Foundation (as a personal three-year operating grant of USD 75 000 to the then President, Prof Wieland Gevers (MASSAf) over the period 2003-6), the Ford Foundation (USD 20 000 over 18 months for a study on the molecular life and health sciences in South Africa), and the IAP (USD 11 000 to support the workshop on science education described in 8.1 above). ASSAf members (currently 261) pay a compulsory annual subscription of ZAR 200. Interest accruing on unspent funds held by the Academy is attributed to projects where this is a set requirement, or it is accumulated and accountably used as operational funds at the direction of the Council.

The draft Strategic Plan now under development makes provision for a greatly enhanced fundraising drive by ASSAf over the next two years. It is expected that studies to be commissioned by government departments or other agencies will generally be funded in full by the commissioning body concerned.



# Programme 4

## National and regional activities

### South African Science and Technology capacities for the 21st century

#### Knowledge production by a new generation

In parallel with an international study by the IAC, ASSAf undertook an extensive local study on S&T capacities in 2002-4. The ASSAf study resulted in three reports: a background document, proceedings of a forum and a synthesis report, combined and printed in one volume in 2005 for ease of reference and dissemination.

ASSAf participated in planning the national consultative conference on knowledge production in South Africa, held at the Cape Town International Convention Centre on 25 July 2005. As a result, consensus recommendations were made to Cabinet on six areas of concern. Important political support for a broad programme of further action was gained through this joint exercise of the Departments of Science and Technology and of Education.

### ASSAf Science-for-Society gold medals

#### An honour of a special kind

At a prestigious ceremony on 28 October 2005 the Honourable Mr Mosibudi Mangena, Minister of Science and Technology presented the third set of two awards of the **ASSAf Science-for-Society Gold Medal** to **Professors George Ellis (MASSAf)** and **Thomas Bothwell (MASSAf)**.

**Citation:** *"In his career Professor George Frederick Rayner Ellis has combined his peerless scientific skills with a finely tuned sense of morality and social activism and action, so that his impact is known and appreciated by a spectrum that extends from scientific elites, communities of researchers and educators, to the poorest of the poor. Now Emeritus Professor and Distinguished Professor of Complex Systems at the University of Cape Town, Ellis is indeed one of the most distinguished scholars, past or present, that this country has produced. His prodigious output over a period of forty years includes over 300 articles or chapters in books, and 12 books – at last count – spanning disciplines as diverse as cosmology, complexity, neural development and the brain, science policy, social*



■ Prof George Ellis (MASSAf)

Winner of the ASSAf Science-for-Society Gold Medal

*development, science and mathematics education, and the relationship between science and religion. He is also a man who has contributed in significant ways, through enduring public service, towards improving the quality of life of the most marginalised of our fellow citizens, and through various means towards the success of our new democracy.*

*George Ellis is a world leader in the areas of general relativity and cosmology, the study of the large-scale structure of the universe. His seminal contributions to this field of endeavour are truly too many to list but include the development of the singularity theorems with Roger Penrose and Stephen Hawking, the monograph 'The Large Scale Structure of Spacetime', written with Hawking, and his fundamental work on observations in cosmological models, in which he addresses the relationship between theoretical cosmology and cosmological observations. In recent years he has written extensively on the topics of emergent universes and 'multiverses'. George Ellis's contributions as a cosmologist would suffice to secure for him a place among the scholarly giants in this country, and indeed globally. But to confine attention only to these achievements would be to present a wholly incomplete picture of the person. For George Ellis is truly a Renaissance Man whose activities, interests and achievements extend across an almost improbably broad range of the sciences and social sciences, and include public and social service.*

*Professor Ellis has written and spoken extensively on topics pertaining to the relationship between science and religion. In 2004 he was awarded the 2004 Templeton Prize, the largest monetary award made to an individual, for his contributions towards achieving a better understanding of the relationship between science and spirituality. In his work George Ellis has advocated a balance between the rationality of evidence-based science on the one hand, and phenomena that lie beyond the ability of science to explain: examples would be aesthetics, ethics, metaphysics, meaning, morality, faith and hope, all of which are 'causally effective'. His key ideas are most effectively captured in his book with Nancey Murphy 'On the moral nature of the universe: Cosmology, theology, and ethics'. In recent years he has turned his considerable intellect loose on problems that represent arguably the greatest challenge to scholarship in the 21st century, viz. a complete understanding of the workings of the brain, and the relationship to human behaviour, the intellect, and emotions. In recent work George Ellis and Judith Toronchuk show how*



## Providing evidence based advice to inform government policy making and public discourse

*insight into these questions can be gained through a synthesis of Edelman's theory of neural Darwinism, that is, the principles of Darwinian natural selection applied to neural processes, and Panksepp's theory of affective neuroscience, which addresses the manner in which neurobiological systems mediate the basic emotions.*

*Professor Ellis is an activist in the best sense of the word, and has over a period of many decades maintained an intense and direct involvement in some of the most pressing social challenges this country has faced, and continues to face. An unrelenting critic of the old apartheid government, he is a committed Quaker, and much of his social involvement has been under the auspices of the Religious Society of Friends. In 1977, he and three colleagues wrote *The Squatter Problem in the Western Cape*, a scathing review of the plight of homeless people. In 1979 he co-authored with David Dewar *Low Income Housing Policy in South Africa*, an analysis of how to transform the desperate housing situation among blacks in greater Cape Town.*

*In addition George Ellis has used with telling effect his scientific intellect to grapple with problems as diverse as mathematics education and public administration. He was a member of the task group that drafted South Africa's Green Paper on Science and Technology in 1995.*

*Professor Ellis has received a host of honours for his many and varied achievements. These include the award by former President Nelson Mandela of the Star of South Africa, and most recently the award of the National Science and Technology Forum for outstanding contributions.*

**Citation:** *“Professor Thomas Hamilton Bothwell, Emeritus Professor of Medicine of the University of the Witwatersrand, devoted much of his academic career, spanning more than 50 years, to the pursuit of scientific research aimed at improving the health and well-being of major sections of the world's population. In doing so, he not only realised these goals, but also set standards of excellence in scientific research that those that follow must strive to emulate. Professor Bothwell's major research thrust has and continues to be iron metabolism and the consequences of too little or too much of the metal. He has written more than 300 full-length articles in scientific and medical journals, chapters in international state-of-the-art textbooks, and invited reviews on many aspects of this subject. His two books on iron metabolism and its disorders are the most comprehensive references available and are essential*



**Prof Thomas Bothwell** (MASSAf)

Winner of the ASSAf Science-for-Society Gold Medal

## Recognising excellence

*reading for any scientist, clinician, or student interested in iron metabolism and its disorders. South Africa provides both unique challenges and opportunities in this field of research, because striking differences in iron balance occur in the different population groups. Varying degrees of iron overload are commonly encountered in the adult black male population, especially in rural areas, whereas iron deficiency occurs frequently in adult females and infants. Professor Bothwell actively engaged in researching both of these aspects. Iron deficiency, in particular, represents a pressing local and global problem and its prevention is an urgent public health priority. Although the total dietary iron content in many cereal-based diets seemed adequate, iron deficiency anaemia was rife in populations consuming such diets. This seeming anomaly directed Professor Bothwell's attention to those food factors that inhibit iron absorption in many staple diets consumed in developing countries. He showed that polyphenols, present in tea, sorghum and legumes, were strong inhibitors of iron absorption and that the most promising enhancer of dietary iron absorption was the chelate NaFeEDTA, which "protected" dietary iron from inhibitors during its passage through the stomach. Professor Bothwell foresaw that the only feasible way of tackling nutritional iron deficiency was to fortify appropriate vehicles in the diet with bioavailable iron, and his trial in Chatsworth using curry powder fortified with iron EDTA represents a landmark demonstration that iron fortification can work. This approach is now being applied in the Far East, and collaborative studies in which Professor Bothwell is currently involved are assessing the relative bioavailability of a number of iron powders that are being used in national fortification programs in many industrialised countries.*

*Running parallel with these clinical studies were a number of basic studies concerned with physiological aspects of iron balance and internal iron exchange. Several seminal observations were made. The major factors regulating iron absorption were defined (the paper reporting this finding became a Citation Classic) and the quantitative limits of iron excretion described. In addition, pioneering ferrokinetic studies were undertaken in which quantitative and qualitative aspects of erythropoiesis were defined in a wide range of haematological conditions. Later studies were concerned with the uptake of iron by red cell precursors, the release of iron from reticuloendothelial cells, and the internal distribution of storage iron. A number of key biochemical and isotopic techniques were developed and described. Not surprisingly, Professor Bothwell has been a member of a number of*



## Promoting South African Science and Technology capacities for the 21st century

*expert committees of the WHO and he directed one of its research laboratories. He also served for many years as an expert consultant to the International Atomic Energy Agency, the Nutritional Agency Consultative group, and SUSTAIN (Sharing United States Technology to aid in the improvement of Nutrition) and played an important role in co-ordinating efforts to eliminate iron deficiency globally. There can be no doubt that Professor Bothwell's many contributions to present-day understanding of iron metabolism and the consequences of its deficiency or excess have earned him the reputation of being one of the pre-eminent international scientists in this field, and further that the products of his research achievements have already and will continue to have a profound effect on the health of a major portion of the world's population. Thomas Bothwell is clearly a most worthy recipient of an "ASSAf Science-for-Society Gold Medal. "*

### ASSAf Lecturer 2005

**Prof George Philander, Princeton University**

The first ASSAf Public Lecturer, Prof George Philander, South African-born geophysicist and climate scientist, visited the country in September 2005 and gave public lectures and advanced seminars in four regional centres, to acclaim from large audiences. He subsequently offered to assist the Academy and other South African institutions to attract young scholars into important disciplines in the applied physical sciences and related areas.

### Key performance indicators for Programme 4

The Academy awarded two more Science-for-Society Gold Medals, arranged a very successful national Lecture Tour by an outstanding South African-born ASSAf Lecturer, started the sponsoring of regular public lectures in large centres, and greatly increased its programme of generating evidence-based advice for the country (reported under the international programme because of its international funding).

# The future

## An Academy of Science that is a unique contributor to national and continental development

ASSAf HAS ESTABLISHED itself as an inclusive but merit-based body that fits contextually into South Africa's democracy because it seeks primarily to mobilise and apply scientific thinking and knowledge for the good of a society with major development needs and objectives. A number of historical factors have not made the Academy's path particularly smooth, but a combination of warm international recognition in an evolving new world science academy system on the one hand, and increasing internal recognition and support by Government (at ministerial and department level) as well as by civil society and academia, on the other, are giving momentum to the Academy's upward trajectory. The inclusion of ASSAf in the funded capacity-building project of the United States National Academies together with Nigeria and Uganda has been a powerful shot in the arm and greatly enhances ASSAf's planning and implementation strengths, while improving its international networking and connectedness. Increased capacity and activity are the essence of ASSAf's future role within our country, as it is enhanced by partnerships with other science academies on the African continent, and generally. The key activity by which the Academy will carve out its national reputation will be the production of authoritative, high-quality reports on key science-based issues affecting the nation's future. Much effort will henceforth go into this aspect.

The Academy's core asset is its membership as reflected in the extensive new ASSAf Register of Members included in this Annual Report in abbreviated but informative format. The stature and involvement of the Academy's members determine the extent and scope of its potential contribution to the country, the continent and the world.

*An Academy of Science that is a unique contributor to national and continental development*



# The multi-year Strategic Plan of the Academy of Science of South Africa

Approved by the ASSAf Council on 22 June 2006

## (A) Points of departure

- **The multi-year Strategic Plan (SP)** for ASSAf should be a maximally useful prospective management tool to achieve organisational agreement on WHERE the Academy is going (sooner and later), HOW it might best get there, and how it WILL KNOW that it got there.
- **The model** for the ASSAf Strategic Plan should be based on goals, issues, values and scenarios.
- **The time-frame** for the ASSAf Strategic Plan should be the three to four years remaining of the ASSAf partnership with the US National Academies within the African Science Academies Development Initiative (ASADI), i.e. 2006-9.
- **The process** to generate a generally agreed Strategic Plan should involve the participation of the ASSAf Council, members and staff, on the one hand, and of important stakeholders, on the other. The latter can significantly improve the contextual formulation of the Academy's mission and vision, help it to assess the current situation in terms of strengths, weaknesses, opportunities and threats (SWOT – see below), and assist in identifying appropriate strategies to attain specific goals and objectives within the selected model and time frame.
- The **content of the Strategic Plan** should enable the Academy to face the future by identifying **strategic priorities** ("WHERE WE WANT TO BE GOING"), listing **specific actions and activities** ("HOW TO GET THERE"), and providing mechanisms for **evaluating and monitoring progress** towards the desired vision ("HOW DO WE KNOW WE'RE GETTING THERE?").
- **Key elements** of the Strategic Plan should be ideas that challenge the status quo, build a shared vision in the organisation, lead to action and effective management, are inclusive, establish effective benchmarks, are sensitive to internal and external environments, and are "thought through".
- **Good practice** in developing an ASSAf Strategic Plan should include effective process management, a hefty dose of realism, avoidance of over-specificity, regular review, and wide dissemination of draft documentation.

*Providing mechanisms for evaluating and monitoring progress towards the desired vision.*

## **(B) A Vision Statement for the Academy of Science of South Africa**

**The Academy of Science of South Africa is the apex organisation for science and scholarship in South Africa, internationally respected and connected, its membership simultaneously the aspiration of the country's most active scholars in all fields of scientific enquiry, and the collective resource that makes possible the professionally managed generation of evidence-based solutions to national problems.**

## **(C) A Mission Statement for ASSAf**

National science academies are assuming increasing importance in the world science system, both as unique and potentially valuable entities in their respective national systems of innovation and science-based development generally, and in regional or other supra-national configurations. The latter extend up to the global body called the InterAcademy Panel (IAP), with its dedicated subsidiary unit (the InterAcademy Council, or IAC), which generates evidence-based reports and recommendations for the global community of nations. Many national science academies are also the adhering bodies of the International Council on Science (ICSU), promoting individual disciplines worldwide, and organising international cooperation in large-scale, global projects.

Like democratic South Africa in general, ASSAf aspires to play both a national and an international role, particularly with respect to the African continent. We see the Academy as usefully at arms length from Government and other organised sections of the state, comprising an assembly of excellent scholars from many disciplines who are well-networked both nationally and internationally and have shown their interest in and capacity for promoting the development of a prosperous and a fully enabled society. Membership of the Academy (by election) is both an honour and an obligation to work individually and collectively (as the Academy) to ensure that decision making that requires scholarly scrutiny and analysis is based on the best and most integrated understandings and insights available to the country. The Academicians thus represent an organised, independent but responsive scholarly voice to help guide the development of the country and its people.



The **mission of ASSAf** can thus be summarised as follows:

- To become increasingly associated in the mind of the nation with the highest levels of scholarly achievement and excellence in the application of scientific thinking for the benefit of society.
- To consolidate its infrastructure and capacity, and to expand and mobilise the membership to ensure that scholars from a full disciplinary spectrum are available for its work, and that these are indeed both thinkers and doers, willing to put significant effort into the Academy's activities.
- To embark on a programme of systematic studies of evidence-based issues of national importance, some proposed by government or other sectors, and some identified by the Academy itself.
- To develop a sound and robust methodology for constituting study panels, organising their work, including conferences and workshops, and producing authoritative reports that are well-disseminated and have significant impact.
- To publish science-focused periodicals, especially a multi-disciplinary journal of high quality (the *South African Journal of Science*) and a science magazine that will showcase the best of South African research to a wide national (and international) audience (*Quest – Science for South Africa*), and to promote the development in South Africa of an indigenous system of research journals of internationally recognised quality and usefulness.
- To develop productive partnerships with other organisations, especially (but not only) the Departments of Science and Technology, Education, Health and Agriculture; the National Advisory Council on Innovation; science councils; higher education institutions, etc., with a view to building capacity in science and its applications within the National System of Innovation (NSI).
- To create new and diversified sources of funding for the sustainable functioning of an independent Academy.
- To communicate effectively with the general and specific publics, as well as with partners and sponsors.
- To develop a plan for the expansion of the activities of ASSAf in partnership with the national science academies of other countries, including the contracted partnership with the US National Academies.

## Scientific thought and activity enrich us profoundly – promoting science for the society

*ASSAf has established itself as an inclusive but merit-based body that fits contextually into South Africa's democracy.*

- To play a significant role in the international science system, particularly in Africa, through organisations such as the InterAcademy Panel (IAP) and the InterAcademy Council (IAC), the Academy of Sciences of the Developing World (TWAS), the International Council on Science (ICSU), as well as the Network of African Science Academies (NASAC), all in the context of the New Partnership for Africa's Development (NEPAD).

### **(D) An analysis of ASSAf's strengths, weaknesses, opportunities and threats made early in 2006**

To quote from the 2004-5 ASSAf Annual Report: "ASSAf has established itself as an inclusive but merit-based body that fits contextually into South Africa's democracy because it seeks primarily to apply scientific thinking and knowledge for the good of a society with major development needs and objectives. A number of historical factors have not made the Academy's path particularly smooth, but a combination of warm international recognition in an evolving new world science academy system on the one hand, and increasing internal recognition and support by Government (at ministerial and department level) as well as by civil society and academia, on the other, are giving momentum to the Academy's upward trajectory. Increased capacity and activity are the essence of ASSAf's future role within our country as well as through partnerships with other science academies on the African continent, and generally. The key activity by which the Academy will carve out its national reputation will be the production of authoritative reports on key evidence-based issues affecting the nation's future; much effort will henceforth go into this aspect. The Academy's core asset is its membership; the involvement and contribution of members determine the extent and scope of our potential contribution."

### **ASSAf's strengths**

- ASSAf is South Africa's ONLY statutory, national science academy and is recognised as such by the country's government and internationally (represents SA in the IAP/IAC global system, and in NASAC on the African continent).



- ASSAf has made considerable headway in terms of establishing and staffing its head office, and will shortly move to the prestigious new DST Building on the CSIR site (see also below under threats).
- ASSAf now has 265 members, distributed evenly over the physical, biological, health-related, social and human sciences, with smaller numbers in the engineering, agricultural, educational and earth sciences. While there is still much work to be done in transformational terms, the significant numbers of black and woman members, in an “apex organisation” that would be expected to reflect the large inequities of opportunity of the past era, is encouraging and a real engine of change.
- ASSAf has been well-supported by grants-in-aid from the Department of Science and Technology and now has additional resources granted by the US National Academies (see also below under risks).
- The two national publications published by ASSAf enjoy respect and recognition: the *South African Journal of Science* as a century-old flagship multi-disciplinary journal that can hold its head high amongst its competitors in the developing world, and *Quest – Science for South Africa* as a young but already leading science magazine attractively and effectively reflecting the best research done in the country.
- ASSAf released its first major Study Report on “A Strategic Approach to Research Publishing in South Africa”. It has important implications for a large number of stakeholders distributed across the entire national system of innovation, and a lasting, high-profile functionality that can henceforth be undertaken by the Academy.
- ASSAf embarked on its first Consensus Study modelled on those performed in the USA by the National Academies, tackling a controversial topic where its evidence-based advice may be very helpful to the country in many contexts and may impact directly on the quality of life of the poor all over the country.
- The previously prevailing model of Academy functioning where an elected Council drives and manages ASSAf’s affairs is beginning to change into one where the membership is more widely drawn into ASSAf activities. Broader participation is enabled by the creation of topic-specific Committees that provide guidance on where the Academy can and should make its contributions to society.

*ASSAf released its first major Study Report on “A Strategic Approach to Research Publishing in South Africa”. It has important implications for a large number of stakeholders distributed across the entire national system of innovation, and a lasting, high-profile functionality that can henceforth be undertaken by the Academy.*

- ASSAf's annually awarded "Science-for-Society" Gold Medal has become a premier mark of peer and systemic recognition of achievements that reflect the Academy's values and mission.
- ASSAf is beginning to help NASAC play its desired continental role.
- ASSAf recently became a member of the influential "science council" sector in the NSTF.

### ASSAf's weaknesses

- ASSAf has failed to resolve the impasse of the country having two "old" quasi-academies continuing to co-exist with it in the South African science system, draining away "academy-type" energy in a country that cannot in appropriate human resources terms support more than one effective national science academy. This is compounded by an absence of consensus on how big (in terms of membership numbers) the Academy should be.
- The ASSAf membership is still largely passive in responding to invitations to participate in Academy affairs and activities that require personal commitment of time and effort. Stated generally, prioritisation of Academy meetings and activities by members, including Council members, is well below that which is characteristic of well-established merit-based national science academies, including those of developing countries such as Brazil, India and Mexico. (Witness the attendance figures for Council meetings and AGMs, and nomination and voting statistics in Membership and Council elections.)
- The system of self-categorisation by members of their disciplinary affiliations has not worked smoothly, the categories are in dispute, and they are not linked to any functional mechanisms within the Academy.
- Support for ASSAf in the senior ranks of its "responsible" government department, the DST, is still highly variable. Invitations to important conferences and workshops are either not forthcoming or have to be solicited post hoc from Departmental officials. As an example, the Academy was omitted from the planning group for the national "Knowledge Production" conference, despite having



offered to be involved, having produced and published the most complete recent report on the topic, and having facilitated the introduction to the country of the prestigious international IAC Report “Inventing a better future”.

- Recognition of ASSAf in government departments other than the DST is extremely rudimentary, as it also is in Parliament, where the Portfolio Committee for Science and Technology only quite recently became aware of some of ASSAf’s activities.
- There is disquieting prevalence of the notion that ASSAf is not sufficiently independent of government. The imminent move to the new DST Building on the CSIR campus will not help to dispel this impression. The listing of ASSAf under the PMFA and the inclusion of the Academy in government budgeting processes do not help either.
- While the new staff members that ASSAf recruited are young and enthusiastic, they are undeniably inexperienced in Academy-type work and will have to learn on the job, so to speak, with implications for negative perceptions on the part of their outside equivalents and the membership itself, until they have found their feet.
- The Academy has strong competition in its niche area of generating evidence-based advice to the government and nation, from a statutory advisory council located within the DST itself (NACI), from science councils such as the CSIR and HSRC who have visible track records in this area, and from government departments themselves, where a preferred model of setting up in-house panels and commissions has prevailed for over a decade.
- The Academy is not well-known or well-understood in the core constituency of effective and flourishing science academies worldwide (i.e. the researchers working at higher education institutions and research-active science councils and industries within the country of which ASSAf is the national science academy). In addition, the membership election procedures are not wholly acceptable to participants in the process.
- Public knowledge of ASSAf is mostly rudimentary (journalists frequently ask: “What does it do?”)

and involvement of the broad, lay science constituency in ASSAf activities is impaired by the unitary “Full Membership” model.

- The Academy has either quiescent or uncomfortable relations with the important science councils, with NACI, and with the Council on Higher Education.
- Overall, ASSAf’s substantive track record of contributions to the National System of Innovation is rudimentary and patchy, even seen from our own perspective, let alone from that of others.

### Opportunities for ASSAf

- The contracted partnership with the US National Academies is high potential and has already made a big difference, both in providing funding for new staff and in developing new structures, financial models and relationships with sister science academies in other African countries.
- ASSAf’s evolving programme of studies of nationally important evidence-based topics should enable it to become a (or the) preferred provider of such advice to government departments as well as civil society.
- NASAC is potentially important as the “voice” of the merit-based, independent African national science academies, and with proper strategic planning, integration into the IAP’s own new system and that of TWAS, as well as effective linkage to NEPAD, it could become a real engine for development of each constituent Academy (ASSAf in this case) and the continental system as a whole.
- There is increasing interest in an alliance between ASSAf and the science academies of leading developing countries such as India, Brazil and Mexico, which would allow ASSAf to become much more active in supporting and facilitating the inter-governmental agreements and structures already set up in this area.
- The possibility of a “symbiosis” model being developed for a more productive co-existence of ASSAf with the much older Royal Society of South Africa (RSSA) and the Suid-Afrikaanse Akademie vir Wetenskap en Kuns (SAAWEK) is an opportunity that could be grasped successfully by visionary leadership on all sides.



## *Virtual national centre for information on research outputs produced in South Africa and or by South African based scientists*

- The creation of regional centres of ASSAf activity may allow more ASSAf members to play significant and rewarding roles in the Academy's affairs, and simultaneously address the Academy's lack of grass-roots recognition and effectiveness.
- Equally, the creation of topic-specific structures ("Committees") within the Academy may allow many members to become involved in ASSAf's planning and decision making, from the drawing up of draft public statements on important science-based issues to oversight of Consensus Studies and Forum-type Studies.
- The recommendations of the ASSAf Report on a strategic approach to research publishing in South Africa involve delegation or permanent assignment of a number of functions in the publication system to the Academy. These include accreditation recommendations to the DoE; periodic peer review and quality assurance of (individual and grouped) South African research journals, and oversight of an information and monitoring system for publications emanating from the country's National System of Innovation.
- The Sydney Brenner Fellowships, constrained at present by the available funds to one Fellowship award every two years, could through energetic fundraising here and overseas become a nationally significant "flagship" post-doctoral fellowship programme.
- ASSAf may become a significant role-player through its newly awarded membership of the science councils sector in the NSTF, if it is seen to make unique and helpful contributions.
- ASSAf has the opportunity to be an important contributor to South Africa's international science relationships through its ability to mediate the inter-academy function inherent in most such interactions.
- ASSAf through its involvement in the IAP science education project could assist the country's educational authorities and schools to achieve much greater success in the critical area of producing qualifiers who are not only adequately proficient in scientific disciplines, but who are committed to careers in the field. (In producing *Quest – Science for South Africa*, ASSAf has already provided a potentially massive asset.)



- ASSAf could create a focus area in the “public understanding of science”, in partnership with SAASTA and other organisations, also in order to involve the public in policy making based on scientific evidence.

### Threats to ASSAf

- The Academy has a very fragile niche in the current South African science system (the NSI) in that it is a newcomer. (Part of the non-recognition experienced by ASSAf to date has arisen from cold-shouldering by potential or real competitors rather than from poor communication.) It has a patchy track record in comparison with its obvious competitors, and has not managed to persuade the pre-existing quasi-academies to quit the terrain. Accordingly, organisations such as NACI, the HSRC and other science councils could prevent ASSAf from realising its mission and effectively “starve” it of worthwhile commissions.
- ASSAf’s resource base is very dependent on the goodwill and judgement of a government department that is now under the direction of a new Director-General. Although the present Minister has been very supportive, political change may come with a newly elected government in 2007.
- ASSAf may fail to “protect” its independent branding in the new DST Building on the CSIR campus and become progressively less able to remain a merit-based, self-perpetuating, internationally recognised science academy, also losing its natural constituency of top scholars in the process.
- ASSAf may be “out-competed” by the RSSA in terms of (out-of-date but still highly prevalent) public perceptions ( especially the perceptions of its base public of scholars and scientists) of what a science academy should in fact do, or even what “science” is.
- ASSAf may fail to establish the necessary effective inter-connections with government departments, continental bodies (e.g. NEPAD) and sister science academies in Africa, and lose momentum in its chosen trajectory.
- Because of its relatively poor lobbying position and unconnectedness in government and related



circles, ASSAf may eventually be unable to make itself heard clearly and loudly enough to make a difference overall.

### (E) Appropriate strategies to attain goals and objectives

The ASSAf Vision Statement adopted in 2005 and modified to become a Mission Statement in (B) above, summarises the goals and objectives of the Academy clearly enough to serve as a set of high-level “clear goals and objectives” for purposes of developing a Strategic Plan. The analysis of the Academy’s current strengths, weaknesses, opportunities and threats (SWOT analysis) provides an additional basis for fleshing out the plan in terms of detail regarding specific actions to be taken and evaluation/monitoring to be done.

The above position deals with the “**goals-based**” aspect of the preferred model, but not with the aspects related to issues and values. Some of the key issues are:

- What are the REAL priorities for effort on the part of South Africa’s high-level scholars and scientists, in terms of the actual situation of this developing country’s people?
- Is a national science academy presently considered by the majority of policy makers in South Africa to be essential or important?
- How can effort on the part of the country’s high-level scholarly infrastructure optimally be focused on the country’s problems in terms of efficiency and effectiveness?
- Should the Academy be a regionally pre-occupied (international) organisation as opposed to a nationally focused one?
- Is there mission drift in national and international science organisations such as ICSU, the IAP and its newly formed regional subsidiaries, and if so, is this a bad thing?
- Is the positivistic thrust of the “socio-economic progress through enhanced Science and Technology” paradigm valid, or, more accurately, sufficient, to meet our national aspirations?

The values involved in our Academy’s functioning are independence of government and sectoral lobbies;

using best-available evidence and knowledge as drivers of thinking about problems and generating recommended solutions; applying multi-disciplinarity and consilience in approach; adhering to the highest ethical and moral norms; recognising the essentially developmental nature of our society AND the importance of the natural environment, both for its own sake and from a human utilitarian perspective. These issues and values need to be represented in the Academy's Strategic Plan.

The **time frame** of the ASSAf Strategic Plan is four to five years, 2006-2009 (perhaps 2010), i.e. the period covered by our partnership agreements with the US National Academies.

ASSAf's **strategic priorities**, based on the Vision and Mission Statements and the situation analysis, and **specific actions** arising therefrom, should include the following:

- Carrying out the approved Action Plans of the USNA-ASSAf partnership meticulously and at the highest performance levels possible, using the evaluation and monitoring aspect of the project to identify shortcomings and measure deliverables in real terms.
- Using the ASSAf Report on a strategic approach to conduct research into publishing in South Africa as an exemplary process of dissemination, stakeholder buy-in and facilitated Implementation. This would include the assignment to ASSAf by the respective authorities of on-going responsibilities and functions in this area.
- Proceeding with the first Consensus Study on nutritional influences on human immunity in ways that establish best-possible practice, robust but flexible policy frameworks, and an impressively useful Report.
- Building participatory internal structures of the Academy by eliminating the self-categorisation model and replacing it with an information matrix generated by the ASSAf General Register of Members. This would serve to generate expert inputs to planning and decision making by the Council and the Academy at large, as well as to constitute focus area committees, Consensus Panels and Steering Committees.
- Developing a sustainable and manageable rolling model for proposing, processing and managing new studies.



## Communicating up-to-date South African scientific research to the public

- Designing and implementing a programme of communication about the Academy that will reach and positively affect every major stakeholder in the knowledge-producing sector at higher education institutions, science councils and in industry, in government at the level of individual departments and in Parliament, and amongst the public at large through effective media releases and articles (see (F) below).
- Discussing with relevant partners how a symbiotic relationship with the two pre-existing quasi-academies can be designed and implemented without impairing the general reality and acceptance of ASSAf's statutory and international status as the country's single national science academy.
- Maintaining the *South African Journal of Science* as the country's premier multi-disciplinary research journal, but aggressively extending its functions into the electronic domain in order to ensure the widest possible dissemination and use of its contents.
- Building *Quest – Science for South Africa* to become the most widely distributed and read general science magazine in the country, a crucial asset for public sector promotion of science education, literacy and career commitment, and sustainably maintained by its constituency of users and stakeholders.
- Increasing ASSAf's productive involvement in NASAC and linking these to the activities of NEPAD agencies and of ICSU.
- Seeking diversified funds to build an endowment for the academy and funding for its activities outside government grants-in-aid (see (G) below).
- Agreeing on an optimal number of Academy members to enhance the visibility and competitiveness of the annual election cycle, and building the membership of the Academy to include more eminent and active representatives of disciplines currently in short supply – notably the agricultural, engineering, earth and educational sciences.
- Increasing the involvement of ASSAf members in the activities of the Academy by regular informative newsletters, inclusion in various task forces and sub-committees, and meticulous records of their achievements and interests in the annual ASSAf General Register.



- Exploring mechanisms for involving young scholars and grass-roots enthusiasts in the activities of the Academy.
- Including the Parliamentary Portfolio Committee for Science and Technology in its communication campaign, working closely with the Ministry and Department of Science and Technology, as well as with other Ministries and government departments.
- Engaging directly in top-level discussions with the Academy's "competitors" in the domain of evidence-based advice on science-related national problems and issues, in order to turn stand-offs into alliances and cooperative ventures.
- Using the accommodation in the new DST Building on the CSIR campus to fashion close working partnerships with the various sections of the Department, but emphasising through clear branding and communication that ASSAf is not, and will never be, a government-controlled organisation.
- Creating inter-academy alliances with the national science academies of leading developing countries such as India, Brazil and Mexico. Such alliances are embedded in the inter-governmental agreements signed by South Africa with these and other similar countries.
- Participating actively in IAP projects such as those in water management and science education, ensuring that South Africa's national interests are also served in the use of the knowledge thus acquired.
- Creating a focus area in the public understanding of science, in partnership with agencies such as SAASTA, that involves the managed participation of the public in debates and public processes along the lines of the successful programme set up in this area by the Royal Society of London in the UK.

The **evaluation and monitoring of ASSAf's progress** in meeting its goals and objectives should be conducted both in the context of the Department of Science and Technology's requirements for its budget control processes and those of the US National Academies partnership, as well as of other sponsorships and partnerships that may arise in future. In the first instance, key performance indicators need to be selected and measured in terms that are as precise as possible. In the second, the agreed objectives



should be evaluated and monitored in association with the appointed external specialists from a consortium of two firms. Both depend on an annual narrative report linked to financial and other forms of reporting. Both are also sensitive to internal and external operating environments.

### **(F) A greatly enhanced public communication mechanism for ASSAf**

The ASSAf website should be professionally re-designed to present a dignified and informative introduction to the activities and products of the Academy. It must inter alia provide free online access to

- all ASSAf Reports and Public Statements;
- details of all ASSAf members and their scholarly interests and contact details (the ASSAf General Register);
- information about governance of the academy, including its Statute, Constitution, Regulations and Standing Orders, as well as Policies and Guidelines;
- notices for public inputs on Academy proposals for Study Panels and Steering Committees, on draft Public Statements and other forms of public participation;
- notices of available awards and contracts;
- the ASSAf Member's Newsletter, and a more general Newsletter (see below);
- access to the *South African Journal of Science* and to *Quest – Science for South Africa*; and
- other items of interest to members, the community of stakeholders, and the broad public.

The ASSAf website must also have a secure access mechanism for confidential communication between the President, the Council and the membership of the Academy. Such mechanism could also be used for the annual election of new ASSAf Members.

The present ASSAf Member's Newsletter should continue as (at least) a quarterly publication, but can readily be adapted to become a general Newsletter to be distributed to all stakeholders, preferably also not less than quarterly, with an interactive letters/correspondence section.

All ASSAf events need to be covered by a press release and related communication programme,

## Providing evidence based advice to inform government policy making and public discourse

connected to all types of media including Sci.DevNet, Africaonline, and similar vehicles.

ASSAf membership and its various awards and fellowships should be widely publicised at universities and other higher education and scholarly institutions, and the website should be popularised as one worth visiting (see above).

ASSAf Reports and Public Statements should be produced in a variety of forms, to facilitate niche-specific dissemination. The *South African Journal of Science* and *Quest – Science for South Africa* should also be used more actively to publicise and disseminate ASSAf events and products.

ASSAf should furthermore brand itself at conferences and similar occasion with banners, posters and brochures and the Academy should become active in public discourse in the literate media.

### **(G) Building up an endowment and a diversified resource base for long-term sustainability**

The Academy requires financial resources to do most of what it seeks to do, but its key resources are its members and the motivating power (once harnessed) of the “Academy idea”.

Partnerships are the key to sustainable support from outside the organisation, and their establishment and sustenance require clear understanding on the part of Academy partners of what the Academy stands for, and what its values are.

Most stakeholders are potential funders in one mode or the other, but most will generally regard helping ASSAf to build an endowment to be a lower priority than obtaining a useful “product” from the Academy in a short time, even when some overhead support is provided in recognition of its enabling importance.

Endowments are most likely to come from individuals as donations or bequests, and such private philanthropy is both an absolute pre-requisite and a catalyst of more giving (an example would be obtaining endowment support for the Sydney Brenner Fellowships from expatriate molecular bioscientists in the USA and UK).



Charitable foundations in countries such as the USA are generally interested in direct, for-performance grants, but they do significant grant making outside their home domain and a select few of them may see the long-term sustainability of an independent and effective science academy as worthy of substantial, endowment-type support. Industry are likely to support national academies only if they see clear evidence of practically beneficial outcomes of academy activities.

The Academy needs a dedicated fundraising group with an activist convenor or chair, committed to doing everything possible to persuade potential funders to provide significant financial support for the Academy and its activities, outside of the present “get-paid-for-a-job-well-done” model.

## **(H) How will we know the Academy has been successful through implementation of its Strategic Plan?**

The first category of indications will be in the scholarly community, where the outcome of the ASSAf membership elections each year will be keenly awaited and nationally reported, including high-profile institutional recognition for new members from the ranks. Membership of the Academy will be the “apex aspiration” of each scholar; participation in Academy business a high priority; award of its medals and prizes the most significant form of being honoured, and the Academy route of contributing to national affairs a personally and collectively preferred one.

A second category of outcomes will be in national policy making and evidence-based information, where

- the Academy will be seen as the best source of evidence-based advice on matters requiring scholarly analysis and a “scientific consensus”;
- ASSAf’s independence of government influence is prized, not least by the government itself; and
- an admirable level of consistent professionalism has been achieved in the processes of setting up and operating consensus panels and steering committees that produce credible and useful public reports.

The third category of enhanced functioning will be in the international arena, where ASSAf will be active in selected niche partnerships that are well-integrated into other forms of international liaison,

## Science based advice for the nation

*Development Initiative (ASADI) and the Network of African Science Academies (NASAC) will be an active driver of continental efforts to exploit the unique potential of national science academies to help in Africa's economic and social development.*

well-resourced, and effective in reaching their stated goals. ASSAf through the African Science Academy Development Initiative (ASADI) and the Network of African Science Academies (NASAC) will be an active driver of continental efforts to exploit the unique potential of national science academies to help in Africa's economic and social development.

ASSAf will have succeeded in making the *South African Journal of Science* into Africa's highest impact research journal, offering worldwide open access to full-text at all times, and *Quest – Science for South Africa* will be a science magazine with national impact in the domains of school education, public understanding of science, and science literacy. ASSAf will also have secured an established and respected role in promoting research publishing in South Africa through the implementation of the recommendations of its 2006 Report.

The Academy will have obtained endowment funds from a number of private individuals and companies, here and abroad, and will have achieved sustainability of resourcing through a mix of funding streams, including bequests, donations, sponsorships and reputation-based commissions.

ASSAf will communicate regularly and effectively with the scholarly community, government, the general public, and international partners, in ways that ensure serious consideration of what is being said and why it is important that it be noted and acted upon, in everybody's interest.



# A short history of how the ASSAf came to be

PARLIAMENT UNANIMOUSLY passed the Academy of Science of South Africa Bill on 26 October 2001, and the Act formally came into operation on 15 May 2002. This allocates to the Academy the domain of the science system of this country that is characteristically occupied by national science academies. Such academies are:

- independent of government (but able to be funded for performing specific tasks);
- self-perpetuating (in the sense that new members or fellows are elected by all existing Members or Fellows, forming a meritocracy as defined in the particular academy's constitution);
- multidisciplinary (striving to represent science as a consilient continuum of knowledge, insight and practical conclusions);
- held in high public regard; and
- connected to the national science academies of other countries (through strong bonds and mechanism of co-operation and exchange).

## The origins of the ASSAf

The best way to describe the ASSAf's beginning is to quote key sections from its 2001 'Plan Document':

### Historical background

The Academy idea has been presented in South Africa in various guises for over 150 years. One historical sequence led from the formation of the South African Institution in 1825 to the South African Philosophical Society in 1877 that developed into the Royal Society of South Africa in 1980, which by virtue of its statutes is dedicated to the furtherance of science but flourishing mostly in English-speaking circles and institutions. A separate historical strand was initiated by a parliamentary statute that in 1909 called into being the Zuid-Afrikaansche Akademie voor Taal, Lettere en Kunste. In 1941 it developed into the Suid-Afrikaanse Akademie vir Wetenskap en Kuns, largely but entirely pre-occupied with the promotion of the Afrikaans language in the arts and sciences. Yet another significant development was

the creation of the Science and Engineering Academy of South Africa in 1986; while a true academy in its mission, it has been forced by the needs of the time temporary to address mainly the serious educational and professionalisation issues which confront blacks in the natural sciences and engineering. Each of these three 'Academies' has a form which has made it, to a lesser or greater extent, and for different reasons in each case, a potential rather than a real academy. In one sense, their coexistence in this country shows the importance of the idea of an academy even in a society fragmented in its historical crucible.

Many other bodies in South Africa were either dedicated to the furtherance of individual disciplines or to the coordination and/or promotion of scientific activities in a limited or broader context. None thus far, however, combined the autonomy, very high quality, and public trust that, together, provide the hallmark of an academy in the true sense – that is, a body with a responsibility to the community as a whole and not to a section of it. A number of scientists, therefore, discussed the possibility of setting up a new academy to fill this gap, and the 'Plan Document' described the process.

### The present initiative

The Foundation for Research Development sponsored informal meetings of a small number of individuals over the period from October 1989 to April 1990. This action had its origin in an enquiry conducted by the Zuid-Afrikaanse Akademie vir Wetenskap en Kuns, which concluded that the Akademie did not function as an academy of science and was not likely to do so in the future. While no such conclusion was formally reached by the Royal Society of South Africa and the Science and Engineering Academy of South Africa, various members of these two bodies agreed to meet with two senior black scientists and several members of the Akademie, in order to seek answers to the following three questions:

- was there a compelling case for the creation of an Academy of Science? and if so
- what general form should the Academy take? and
- how could it be brought into being?



## *Promote innovative and independent scientific thinking*

Mindful of the failure of previous attempts to develop an Academy of Science for South Africa, the group decided to seek informal consensus on these questions and then developed the issue in a wider context. This informal group did not aim for a scholarly analysis of the situation, but viewed itself rather as a gathering of ‘concerned citizens’ whose goal was the rapid facilitation and stimulation of further actions and processes that might be needed.

The group concluded that ‘a new Academy of Science would be most valuable at a time when there are better prospects than ever before for commonality of purpose amongst South Africans and when the potential for good and effective action by such an Academy is especially great; this applies to both the internal and external terrains of scientific activities’. The mission of the Academy, as defined at the time, would be ‘to apply the highest level of scientific thinking in the service of the nation and especially to the instrument for conveying considered scientific opinion and advice to government, the people and the world at large’.

To enable the ASSAf to fulfil its mission, the Plan Document contained the following outline of an enabling organisational structure.

### **The position and structure of the Academy**

With respect to the optimal form of an Academy of Science of South Africa, the group believes that the new body should be centrally placed in the system of science in the country; it should not adapt to other existing organisation, but the latter should rather be encouraged to adapt to it in a synergistic manner. The Academy should be autonomous and independent of government control. (Note: this does not exclude an enabling parliamentary Act that would clearly define the powers of the Academy to elect its own members and office bearers, to operate its own financial affairs and to speak its mind at any time on any matter within its competence, limited in all instances solely by codified civil and criminal law). The Academy should elect its members on the basis of general as well as special scientific abilities, since the intention is to create a body of persons who will be activists in the good sense of the word.





The cardinal emphasis in the Academy would thus be on service as well as on recognition or reward for past achievements, on the solution of problems through scientific analysis rather than the stimulation of individual scientific disciplines, and on the promotion of scientific thinking and activity in the broad rather than the narrow sense.

The Academy of Science, as a premier, non-governmental, scientific body, should be in a particular favourable position to act as a link with international scientific unions and related organisation. It should also be to establish fruitful links with academies (or equivalents) that exists in other countries. In Africa, especially, it should interact with equivalent academies, and form regional or continental organisation with common purposes and objectives.

*The Academy of Science of South Africa is constituted to ensure that leading scientists, acting in concert and across disciplines can promote the advancement of the application of Science to the problems and challenges facing South Africa*



## Executive summary

FOLLOWING THE CLOSURE of the erstwhile Bureau for Scientific Publications (BSP) and the termination of the policy of state subsidisation of selected flagship research journals, the Academy of Science of South Africa (ASSAf) signed a contract with the then Department of Arts, Culture, Science and Technology (DACST, now the Department of Science and Technology, DST) in December, 2001. The contract required ASSAf to recommend and support a new strategic framework for South Africa's research journals, on the basis of evidence and comparative information; ASSAf was to work in partnership with a number of organisations.

The main objectives of this strategic framework were to:

- promote/enhance the standing and effectiveness of South Africa's research journals, nationally and internationally;
- improve the productivity/efficacy of publication through different modalities (e.g. electronic publication);
- establish the *South African Journal of Science* (SAJS) as a "national asset" of high quality; and
- ensure that discoveries and insights gained through research published in South African journals were made known to a wider public than the research community itself.

The strategic goal that is the point of departure for this ensuing six-chapter Report is to help develop and maintain a robust national system of innovation that contributes materially to the sustainable prosperity of all South Africa's people. In other words, a scenario where large numbers of lively, enquiring and enterprising people have scope for productive careers and involvement as leaders in science-based efforts to promote the development of the whole nation's skills and resources.

Research publishing fits into this demanding vision, in the context of rapid change, through its core role as the documented vehicle of science-based progress and effective attainment of sufficient high-level human capacity to address the most challenging problems and to provide inspiration to the brightest minds amongst the youth. In addition, it plays a key role in training by furnishing the most rigorous tests of resolve and originality. It also connects the people carrying the science system of a country with the

## *An Academy of Science can serve as a unique and valuable entity, in national systems of innovation and science based development*

*That all stakeholders in the South African research enterprise should each in their own way support local/national research journals that actively seek to be of international quality and are indexed in an internationally recognised, bibliometrically accessible database, through following best-practice in editorial discernment and peer review, including adaptations.*

best of their international counterparts, and helps to establish a country's reputation to attract investment and foreign support.

### **Recommendation No 1**

That all stakeholders in the South African research enterprise should each in their own way support local/national research journals that actively seek to be of international quality and are indexed in an internationally recognised, bibliometrically accessible database, through following best-practice in editorial discernment and peer review, including adaptations

- that address inherent problems and capitalise on technological innovations;
- that judiciously enrich content to promote coherence and value-adding functions;
- that provide the local scholarly community with opportunities for participating in the full range of scholarship-enhancing activities associated with the process of publishing original research outputs;
- that vigorously seek financial sustainability from multiple income streams; and that accept systemic peer review and periodic audit which has a marked developmental focus.

(The rationale for this broad recommendation is fully laid out in the chapters of this Report. In respect of financial viability of South Africa research journals, the general acceptance, in the special South African context where accredited institutional publication outputs are subsidised, of a per-article institutional charge system (linked in the case of higher education institutions to an agreed fraction of output publication subsidies, and in the case of other research-producing institutions to adapted budgeting practice), would produce marked benefits at minimum cost, and naturally lead to a more rapid expansion of the Open Access mode of online publication, on the basis of "institution pays (a little), the whole nation/world benefits (a lot)". Key actors in bringing about the necessary policy and organisational frameworks would be research funders and supporters, including the Departments of Education and Science and Technology, the NRF and the MRC, all working with the Academy of Science of South Africa in downstream implementation mode following the release and general discussion of this Report. Data presented in this Report show that a fixed per-article institutional charge of R 1000, by an accredited journal that should be able



annually to publish at least 100 articles, would provide a reliable income stream to that journal of R 100 000, which when added to subscription and other existing and probably expandable income streams, would create a basis for sustainable publication not now in place for most South African research journals. At the same time, the diversion to research journals of 1.43% of the publication subsidy stream would be insignificant against the benefits of the improvement in the quality and visibility of the publication outputs of the institutions concerned, not to mention the secondary benefits of enhanced scholarly functioning in general.)

## Recommendation No 2

That both high-level (Departments of Education and of Science and Technology, CHE/HEQC, NACI and NRF) and wide-ranging (higher education institutions, science councils) discussions be held to design a robust, well-informed and accountable mechanism for the accreditation of research journals (and probably also of books and other outputs of scholarship), that will meet the different although often convergent requirements of the multiple stakeholders in the national system of innovation.

(The current accreditation system of the Department of Education is not designed to meet the needs of other participants in the national system of innovation. Thus the accreditation step in respect of every single research publication, over which the DoE has complete control, feeds decisively into the policy frameworks of other organisations such as the CHE/HEQC (in terms of its functions of quality assurance of research and postgraduate training at higher education institutions), the NRF (for general grant-making and bursaries at the same institutions), the Department of Science and Technology, NACI and the scientometric compilers of annual S&T indicators (as one of the key determinants of output units), and the higher education institutions and science councils (in terms of internal planning and resourcing policies and reward systems), not to mention the journals themselves. The accreditation function has to be credible, transparent, well-administered and generally promotive of higher standards and greater general utility and significance, nationally and internationally. A developmental approach to the accreditation of research journals requires implementation through a combination of widely accepted best-practice guidelines and quality promotion, with periodic peer review and assessment against criteria that can meet the needs of ALL

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*That the quality assurance system be used to promote best-practice in publishing of original research work, and to emphasise and enhance the training function served by the whole exercise of publishing original papers in the peer-reviewed literature.*

the users of the system as listed above. If the Academy is to be involved in the national research publishing system in related, significant ways (see recommendation below for a quality assurance system for South African research journals, and for a general development programme for publishers, editors and reviewers, both coordinated and overseen by the Academy), this needs to be taken into account by the important stakeholders in the system when designing a robust, accountable and effective accreditation system for national research journals that satisfies their individual but mostly converging requirements to the greatest degree possible.)

### **Recommendation No 3**

**That the proposed best-practice guidelines presented in Chapters 1 and 6 of this Report be widely discussed under the aegis of the Academy of Science of South Africa, formulated into a concise readable document, and then publicly adopted by editors and publishers throughout South Africa, especially those relating to effective peer review and wise and appropriate editorial discernment.**

(Particularly important aspects are the training/guidance of editors and reviewers in their critical respective functions in the publication process, and the enhancement of recognition of this kind of work in general academic reward mechanisms. The Academy of Science of South Africa could work with a number of different institutions to ensure that a spread of courses, workshops and online offerings is available on a regular basis, that a national editors' network is formed, and that it mediates in conveying the collective or individual concerns of publishers and editors to the relevant authorities.)

### **Recommendation No 4**

**That the quality assurance system now being put into place by the Council of Higher Education/Higher Education Quality Committee (CHE/HEQC) be used by that agency and by its partner higher education institutions to promote best-practice in publishing of original research work, and to emphasise and enhance the training function served by the whole exercise of publishing original papers in the peer-reviewed literature.**



## *Scientific thought and activity enrich us profoundly – promoting science for society*

(The CHE/HEQC has achieved much in its best-practice guidelines for teaching and learning in higher education institutions, and is currently approaching postgraduate education and associated training in the same manner. Amongst the publication-related aspects of the latter, much good would come if all stakeholders emphasised the desirable and necessary relationship of conference presentations and dissertations to peer-reviewed publications emanating from the same work or study. A second benefit would come from systematically removing the perception that the (valuable) translation of research results into public benefits necessarily means that proper publication of the work concerned is not needed or should enjoy much lower priority.)

### **Recommendation No 5**

**That ASSAf be mandated jointly by the Departments of Education and Science and Technology to carry out external peer review and associated quality audit of all South African research journals in 5-year cycles, probably best done in relation to groups of titles sharing a particular broad disciplinary focus, in order to make recommendations for improved functioning of each journal in the national and international system.**

(A light-touch but robust review and audit system, analogous to the periodic quality assurance reviews of the functioning of higher education institutions now routinely conducted by the Council on Higher Education/Higher Education Quality Committee, would help greatly to address problem areas and encourage enhanced functioning of research journals published in South Africa. Such functioning would include: quality of editorial and review process; fitness of purpose; positioning in the global cycle of new and old journals listed and indexed in databases; financial sustainability; and scope and size issues. Following on the momentum generated by the activities carried out as part of its research journals project and the production of this Report, the Academy of Science of South Africa would be the most suitable agency to oversee and be accountable for this work, obtaining system support for the best-practice guidelines, and appointing review panels and managing their work; some of the reviews could be done in respect of groups of journals with broadly similar focus.)

*That ASSAf be mandated jointly by the Departments of Education and Science and Technology to carry out external peer review and associated quality audit of all South African research journals in 5-year cycles, probably best done in relation to groups of titles sharing a particular broad disciplinary focus, in order to make recommendations for improved functioning of each journal in the national and international system.*

*That the Department of Science and Technology takes responsibility for ensuring that Open Access initiatives are promoted to enhance the visibility of all South African research articles and to make them accessible to the entire international research community.*

### **Recommendation No 6**

That the Department of Science and Technology takes responsibility for ensuring that Open Access initiatives are promoted to enhance the visibility of all South African research articles and to make them accessible to the entire international research community. Specifically:

- online, open access (“Gold route”) versions of South African research journals should be funded in significant part through a per-article charge system (linked in the case of higher education institutions to an agreed fraction of output publication subsidies, and in the case of other research-producing institutions to adapted budgeting practice), but publishers should still sell subscriptions to print copies and should maximise other sources of income to lower the article-charge burden;
- a federation of institutional Open Access repositories, adhering to common standards, should be established (“Green route”), with resources made available to help institutions in the preliminary stage, this virtual repository to be augmented by a central repository for those institutions which are unable to run a sustainable repository;
- national harvesting of South African Open Access repositories should be undertaken as a matter of urgency, preferably by the NRF; and the importance of affordable bandwidth for research communications for this purpose be drawn to the attention of DST officials negotiating for better rates.

(This proposal holds significant logistic implications for the development and maintenance of adequate broadband connectivity and related infrastructure, but the imminent high-speed/broadband national system or “superhighway”, envisaged for use by research-active institutions and others, will make things possible that have only been dreamt of up to the present time. The virtual repository would capitalise on institutional efforts, provided agreed standards were adopted, and provide a publication route for researchers in institutions without such a repository. The emphasis should be on “leapfrogging” the present turmoil and confusion in the system. The clear need for caution in assessing the presently somewhat vaguely defined business models for open access systems should not prevent the country from moving forward resolutely with a well-resourced programme for expanding its electronic access to the global and national scientific literature.)



## *The application of scientific thinking for the benefit of society*

### **Recommendation No 7**

That a consortium of agencies be asked by the Department of Science and Technology to form a virtual “national research publications information and research centre”, probably best overseen by the Academy of Science of South Africa, which will continuously gather and analyse information on South African journals as well as on publications in foreign journals emanating from authors working in this country, following up on the studies presented in this Report and in the (rather few) previous relevant publications. This entity could also be used to support the training function envisaged in Recommendation 2.

(The proposed managed consortium would supply a number of government departments with reliable information for policy implementation purposes – the Department of Education and/or ASSAf, for accreditation of local journals; the National Research Foundation, for assisting value-based grant-making; the Council on Higher Education/Higher Education Quality Committee, for enhanced quality assurance at research-active institutions; agencies carrying out large-scale evaluations of R&D such as the HSRC, reliable bases for validating output data; and higher education institutions and other research producers, for accelerated researcher development and overall research planning.)

### **Recommendation No 8**

That a wide-ranging project be initiated by the national Department of Education and the provincial education authorities that will sharply increase the exposure of teachers, teachers-in-training and learners to local science journals and magazines that present the country’s foremost scientific work in accessible form, and are effectively linked to the media.

(One of the most cogent reasons for publishing research journals locally is the opportunity beneficially to reach the next generation in ways that are not possible with expensive international periodicals; this needs to be planned in partnership mode, however, and will not happen without strong top-down sponsorship and appropriate resourcing.)

*That a wide-ranging project be initiated by the national Department of Education and the provincial education authorities that will sharply increase the exposure of teachers, teachers-in-training and learners to local science journals and magazines that present the country’s foremost scientific work in accessible form, and are effectively linked to the media.*

*That the Department of Science and Technology should assume responsibility for seeing to it that the South African science/innovation community, including itself and other government agencies, becomes involved in international action to promote the rapid but evolutionary development of a non-commercial, expanded, diversified and more inclusive international listing and indexing system for research journals, within the evolving electronic knowledge-disseminating and -archiving system.*

### **Recommendation No 9**

That the Department of Science and Technology should assume responsibility for seeing to it that the South African science/innovation community, including itself and other government agencies, becomes involved in international action to promote the rapid but evolutionary development of a non-commercial, expanded, diversified and more inclusive international listing and indexing system for research journals, including those published in developing countries, within the evolving electronic knowledge-disseminating and -archiving system.

(There are clear needs for a new, consultative and collaborative approach to meeting the requirements of developing as well as developed countries; of countries using languages other than English as vehicles for doing and reporting research; of disciplines with systems of scholarly practice differing from the “natural sciences standard”; in a system that provides full transparency and low-cost access to data in terms of the databases to be used and maintained. It could be argued that this need is on a par with other more well-publicised and public requirements to level the playing fields in a structurally unequal world (ICSU Report on “Scientific Data and Information”, 2004). The lead organisations in this effort should be the Departments of Science and Technology and of Education and the NRF, working closely with the Academy in terms of its international partners and other relevant agencies.)

### **Recommendation No 10**

That the findings and recommendations contained in this Report be presented to key stakeholders in a series of consultative workshops, and that the outcomes and the impact of the publication of the Report be evaluated in three years time.

(This Report could have made radical proposals and recommendations supported by evidence presented in the various chapters. This approach has not been taken, however, because of the large number of inter-dependent stakeholders, the extreme fluidity of the sector in global terms, and the conviction of the authors that only a consultative process is likely to achieve the recommended results. We believe the present Report provides a



necessary but obviously not sufficient basis for important reforms and considerable advancement of South Africa's research potential and actual performance – joint downstream efforts will be needed, at both the widely distributed knowledge production and more focussed governance levels.)

## *Science based advice for the nation*



# ASSAf's Short Bio of Members

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- **Reinhard Richard Arndt** was President of the Foundation for Research Development, now incorporated into the NRF. He established RAU's chemistry department and was also professor of organic chemistry at the University of Stellenbosch.
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- **Ariff Ahmed Haffejee** is Professor of Surgery and Chief Specialist Surgeon at the University of KwaZulu-Natal.
- **Fritz J.W. Hahne** was Professor of Theoretical Physics and Dean of Science at the University of Stellenbosch.
- **Ray Haines** is retired Professor from the University of KwaZulu-Natal, now at the University of Cape Town. He was Professor of Inorganic Chemistry at the University of Natal, Pietermaritzburg, and directed the University of Natal/CSIR Unit of Metal Cluster Chemistry.
- **Ronald Harley** is Professor at the Georgia Institute of Technology, Atlanta, USA. He was Professor of Electrical



Machines and Power Systems, Department Head of Electrical Engineering and for some periods also the Dean of Engineering at the University of Natal.

- **Susan Thérèse Largier Harrison** is Professor in the Department of Chemical Engineering, University of Cape Town and Director of the Bioprocess Engineering Research Unit. .
- **Rashid Hassan** is Director of the Centre for Environmental Economics and Policy in Africa, University of Pretoria.
- **Manfred Armin Hellberg** is Emeritus Professor of Physics and Senior Researcher Associate at the University of KwaZulu-Natal. He was Professor and Head of Department, Dean of Science and was twice Pro Vice-Chancellor at the University of KwaZulu-Natal.
- **Fred Thomas Hendricks** is Professor of Sociology at Rhodes University.
- **Diane Hildebrandt** is the Unilever Professor of Chemical Engineering at the University of Witwatersrand.
- **Michael Johann Richard Hoch** is an Honorary Research Fellow at the University of the Witwatersrand, and Visiting Research Scientist at the National High Magnetic Field Laboratory, Tallahassee, FL, USA. He was City of Johannesburg Professor of Physics and Head of the Physics Department at the University of the Witwatersrand.
- **Jan-Hendrik Servaas Hofmeyr** is Professor in the

Department of Biochemistry at the University of Stellenbosch. He currently chairs the International Study Group for Systems Biology.

- **Catherine A. Odora Hoppers** was a Professor at the University of Pretoria, specializing in indigenous knowledge.
- **Henk Huismans** is Professor and Head of the Department of Virology, and Director of the Molecular Biology of Orbiviruses Research Group, at the University of Pretoria.
- **Brian Huntley** is Chief Executive Officer of the South African National Biodiversity Institute and Chairs the Harold Pearson in Botany, University of Cape Town. He coordinated the Council for Scientific and Industrial Research's Cooperative Scientific Programmes.
- **Gregory Dudley Hussey** is Professor and Interim Director of the Institute of Infectious Diseases and Molecular Medicine at the University of Cape Town. Previously, he was Head of the Pediatric Infectious Diseases Unit in the School of Child and Adolescent Health at UCT.
- **David Harris Jacobson** is a UK Chartered Engineer. He was a Professor at the Department of Computational and Applied Mathematics University of the Witwatersrand, Associate Professor, Harvard University and he has been an Honorary (Adjunct) Professor at the University of the Witwatersrand.

- **Wilmot James** is Executive Director of the Africa Genome Education Institute, and a Board member of the Ford Foundation. He was previously Dean of the Faculty of Humanities and Professor of Sociology at UCT, and Director of IDASA.
- **Jonathan David Jansen** is Professor of Curriculum Studies and Dean of the Faculty of Education at the University of Pretoria. He has recently been appointed as the Administrator of the Durban University of Technology.
- **Mohamed S. Jeenah** is the Director of the Innovations Network at the University of Pretoria.
- **Trefor Jenkins** is Professor Emeritus and Honorary Professorial Research Fellow, Division of Human Genetics, School of Pathology, National Health Laboratory Service at the University of the Witwatersrand. He was Professor and Head, Department of Human Genetics and Director at the University of the Witwatersrand.
- **Colin Thomas Johnson** is Vice-Principal and Pro Vice-Chancellor of Rhodes University. He was President and CEO of the Agricultural Research Council. He has been Professor of Botany and Dean of the Faculty of Natural Science at the University of the Western Cape.
- **Eugene Llewellyn Julies** is Executive Director of Warrods Consulting, and Chief Technical advisor to the

Ministry of Commerce in Afghanistan. He has been the CEO of the South African Bureau of Standards.

- **Eliot Kahn** was Dean of Law at the University of the Witwatersrand.
- **Loveness Kaunda** is Director of the International Academic Programmes Office at the University of Cape Town. Previously she was Dean of Students at the University of Cape Town.
- **Michael Charles Kew** is Dora Dart Professor of Medicine, University of Witwatersrand, Director of the MRC/University Molecular Hepatology Research Unit, Physician-in-charge, Liver Clinic, Johannesburg Academic Hospital, Honorary Consultant Hepatologist, Chris Hani/Baragwanath Hospital.
- **Benito Makhala Khotseng** is Visiting Professor of Comparative Education at Seton Hall University, New Jersey, USA. He was Deputy Vice-Chancellor at the Free State University in Bloemfontein
- **Ralph Emmanuel Kirsch** was Professor in the Department of Medicine, Faculty of Health Sciences, University of Cape Town. He has served as President of the Colleges of Medicine of South Africa.
- **Johann Frederick Kirsten** is Professor and Head of the Department of Agricultural Economics, Extension and Rural Development. at the University of Pretoria.

- **Duard Godfried Kleyn** is Professor and Dean of the Faculty of Law at the University of Pretoria.
- **Horst Helmut Klump** is Professor emeritus of Biochemistry at the University in Cape Town and Visiting Professor in the Department of Chemistry and Biological Chemistry, Rutgers University, New Jersey, USA.
- **Carolina Koornhof** is Dean of the Faculty of Economic and Management Sciences at the University of Pretoria.
- **Girish Jayant Kotwal** is Professor and Chair of Medical Virology and member of the Institute of Infectious Diseases and Molecular Medicine at the University of Cape Town. He is currently Senior International Wellcome Trust Fellow for biomedical Sciences in South Africa.
- **Bernard Christiaan Lategan** is Director of the Stellenbosch Institute for Advanced Study. He was dean of the Faculty of Arts and Social Sciences, and served on the Council of the University of Stellenbosch.
- **Attie Johannes Ligthelm** is Dean of the School of Dentistry of the University of Pretoria. He joined the Faculty of Dentistry and served as Head of the Department of Oral Pathology and Oral Biology at the University of Pretoria.
- **Brenda Louw** is Professor in the Department of Communication Pathology at the University of Pretoria. She is also the Director of the Centre for Early Intervention in Communication Pathology.

- **Johann R. E. Lutjeharms** is the Professor and head of Ocean Climatology at the University of Cape Town.
- **Silvana Luyckx** is a Visiting Professor at the School of Chemical and Metallurgical Engineering, University of the Witwatersrand.
- **Christopher Cuthber Posela Madiba** is Chief Director for Systems Development and Coordination in the Department of Education. He was a lecturer in Physics at the University of Witwatersrand and was an Associate Researcher at the Schonland Centre for Nuclear Sciences.
- **Nomathemba Virginia Magi** is a Project Manager at the Department of Education. She was the Dean of the Faculty of Education at the University of Zululand.
- **Sunil Dutt Maharaj** is Professor of Applied Mathematics in the School of Mathematical Sciences at the University of KwaZulu-Natal and Director of the Astrophysics and Cosmology Research Unit. He was Head of School of Mathematical Sciences.
- **William M. Makgoba** is Professor and Vice-Chancellor at the University of KwaZulu-Natal. Previously, he was President of the Medical Research Council and Deputy Vice-Chancellor at the University of the Witwatersrand.
- **Duma Enoch Malaza** is Executive Director of Higher Education South Africa. He is the former Director of Quality Assurance at the University of Pretoria. He has served



as Deputy Vice Chancellor and Acting Vice Chancellor at the University of Transkei.

- **Johannes Albertus Geldenhuys Malherbe** is retired Professor of Electronic and Computer Engineering at Pretoria University. He was Dean of Engineering and Vice Principal at the University of Pretoria. He was Managing Director of the Laboratory for Advanced Engineering.
- **Chabani Noel Manganyi** is Vice Principal of the University of Pretoria. He has been Vice-Chancellor of the University of the North and Director-General in the Department of Education.
- **Thabane Vincent Maphai** is Chairman of BHP Billiton SA and formerly Corporate Affairs Director of South African Breweries and non-Executive Chair of Castle Brewing, Namibia. He was appointed Professor at the University of Cape Town. He was Research Executive Director of Social Dynamics at the Human Sciences Research Council.
- **Adrian David Marais** is Head of the Division of Lipidology in the Department of Internal Medicine at Groote Schuur Hospital and has a joint appointment with the University of Cape Town Health Sciences Faculty.
- **Thoko V. Mayekiso** is Professor and Acting Dean and Head of School of Human and Community Development, University of the Witwatersrand.
- **Bongani Mawethu Mayosi** is Professor and Head of the

Department of Medicine at the University of Cape Town and Groote Schuur Hospital, and Consultant Cardiologist.

- **Anthony David Mbewu** is the Interim President of the Medical Research Council of South Africa and a Visiting Professor in Cardiology and Internal Medicine at the University of Cape Town. He was appointed Executive Director for Research at the MRC.
- **Veronica McKay** is Professor and the Director of the Institute of Adult Basic Education and Training at the University of South Africa.
- **Barry Vincent Mendelow** is Emeritus Professor in the Department of Molecular Medicine and Haematology at the University of the Witwatersrand. He was Professor and Head of Pathology at the Chris Hani Baragwanath Hospital and Head of the Department of Molecular Medicine and Haematology at the University of Witwatersrand.
- **Joseph Philip Michael** is Professor of Organic Chemistry at the University of the Witwatersrand. He has served as Assistant Dean in the Faculty of Science, and is Deputy Head of the School of Chemistry.
- **John Robert Midgley** is Professor of Law and Dean of the Faculty of Law at Rhodes University. He was a Research Fellow at the University of Leicester.
- **Duncan Mitchell** is Professor of Physiology at the University of the Witwatersrand.

- **Valerie Mizrahi** is Research Professor, Director of the Molecular Mycobacteriology Research Unit, Alternate-Director of the DST/NRF Centre of Excellence for Biomedical TB Research at the University of the Witwatersrand and National Health Laboratory Service. She was former Vice-Chancellor at the University of Cape Town.
- **Philemon Mphathi Mjwara** is the Director-General of the Department of Science and Technology. He was the Group Executive of Research and Development: Strategic Human Capital Development at the Council for Scientific and Industrial Research.
- **Renosi D. Mokate** is Deputy Governor and Executive Director at the Reserve Bank. She has been the Chairperson of the Financial and Fiscal Commission.
- **Khotso Mokhele** is President and Chief Executive Officer of the National Research Foundation. Formerly he was Vice-President of the Foundation for Research Development (FRD). He was also the first President of the Academy of Science of South Africa
- **Harm Moraal** is Professor, and Director of the Antarctic Research Programme at the Potchefstroom University. He was previously Associate Professor and Head/Director of School of Physics.
- **Vincent Clifford Moran** is Emeritus Professor from the University of Cape Town. He holds a research position in

the Zoology Department at UCT, where he was Dean of the Faculty of Science.

- **Lynn Morris** is a Chief Specialist Scientist and Head of the AIDS Unit at the National Institute for Communicable Diseases in Johannesburg. She holds a joint appointment (Associate Professorship) at the University of the Witwatersrand.
- **Johann Mouton** is Professor in Sociology and Social Anthropology and Director of the Centre for Research on Science and Technology at Stellenbosch University. He was formerly Head of the Centre for Research Methodology at the HSRC and Executive Director of the Centre for Science Development.
- **Bangilizwe R. Mqeke** is Professor and Dean of law at Rhodes University. He is also an Advocate of the High Court of South Africa.
- **Marie E Muller** is Professor and Dean of the Faculty of Humanities at the University of Pretoria.
- **Sagadevan Govindasamy Mundree** is an Associate Professor in the Department of Molecular and Cell Biology at the University of Cape Town. He is CEO of the PlantBio Trust.
- **Christina Mynhardt** is Professor in the Department of Mathematics and Statistics at the University of Victoria, Canada.

- **Mbulelo Mzamane** is the former Rector of the University of Fort Hare.
- **Frank Reginald Nunes Nabarro** (deceased) was Emeritus Professor of Physics, University of the Witwatersrand. He was also Professor Emeritus and Senior Research Associate of the University of KwaZulu Natal. He also served as Head of Department of Physics, Dean of Science and Deputy Vice-Chancellor at the University of the Witwatersrand.
- **Gonasageran Naidoo** is Professor in the School of Biological and Conservation Sciences, University of KwaZulu Natal. He served the former University of Durban-Westville as head of Botany, Director of the School of Biology and Deputy Dean of the Science Faculty.
- **Luigi Renzo Nassimbeni** is Senior Research Scholar of the University of Cape Town. He held the chairs of Chemical Crystallography and Physical Chemistry at UCT.
- **Nicoli J. Natrass** is Professor of Economics and Director of the Centre for Social Science Research (CSSR) at UCT.
- **Daniel James Ncayiyana** is honorary Professor of Obstetrics and Gynaecology at the Universities of Cape Town and KwaZulu-Natal. He serves as Advisor to the President of the HSRC. He was Acting Vice Chancellor, University of Transkei, Deputy Vice-Chancellor at the

University of Cape Town and Vice Chancellor, Durban Institute of Technology.

- **Njabulo Simakhahle Ndebele** is Professor and Vice-Chancellor of the University of Cape Town. He has served as Vice-Chancellor of the University of the North, Vice Rector of the University of the Western Cape, and Pro-Vice-Chancellor National University of Lesotho..
- **Phuthi E. Ngoepe** is Professor and Director of the Materials Modelling Centre of the University of Limpopo.
- **Mokubung Nkomo** is Professor in the Department of Education Management at the University of Pretoria. He was the former President, as well as the former Executive Director of the Group: Education and Training, at the HSRC.
- **Wiseman Nkuhlu** is chairman of the NEPAD Steering Committee and was the economic advisor to President Thabo Mbeki.
- **Jo M.F. Noero** is Professor and Director in the School of Architecture at the University of Cape Town. He was the Ruth and Norman Moore Chair of Architecture at Washington University and Director of Graduate Studies.
- **Loyiso Gordon Nongxa** is Professor, and Vice-Chancellor and Principal at the University of Witwatersrand. He was previously Deputy Vice-Chancellor: Research at the University of Witwatersrand, and Dean of Science at the University of the Western Cape.



- **Tebello Nyokong** is Professor of Physical Chemistry at Rhodes University. The Order of Mapungubwe: Bronze was bestowed on her by President Mbeki. She was also the winner of the SABC2/Shorprite-Checkers Woman of the year in Science and Technology in 2004.
- **Cyril Thomas O'Connor** is Dean of the Faculty of Engineering and the Built Environment and Director of the Mineral Processing Research Unit at the University of Cape Town. Previously, he was Professor and Head of the Department of Chemical Engineering at UCT.
- **Darragh O'Donoghue** is Co-Director of the Whole Earth Telescope, and Head of the Instrumentation Division at the South African Astronomical Observatory (SAAO).
- **Douglas William Oliver** is Professor of Pharmacology and the Director of the School of Pharmacy at the North-West University. He was Director of the Focus Area for Drug Design and Development of North-West University.
- **Phillip Onyebujoh** is the Manager for Proof of Principle and Implementation Research on Tuberculosis and Leprosy at the World Health Organization.
- **Gilbert Oke Martin Onwu** is Professor of Chemical Education in the Faculty of Education and Head of the Department of Science, Mathematics and Technology Education at the University of Pretoria. He was Professor and Head of the Institute of Science and Mathematics Education University of Venda.
- **Frederick Mark Orkin** was President and CEO of the Human Sciences Research Council, Head of Statistics South Africa and Professor of Social Research Methodology in the Faculty of Management at the University of the Witwatersrand.
- **Nicky Gopalan Padayachee** was Professor and Dean of the Faculty of Health Sciences, University of Cape Town. He is President of the Health Professions Council of South Africa.
- **Iqbal Parker** is the Head of the Division of Medical Biochemistry and Director of Research in the Health Science Faculty at the University of Cape Town. He was President of the South African Society of Biochemistry and Molecular Biology.
- **John E. Parkington** is Professor in the Department of Archaeology at the University of Cape Town.
- **Adrian (Adi) Walter Paterson** is a Deputy Director-General in the Department of Science and Technology. He has served on the Executive of both the CSIR and the University of Pretoria. He was a Member of the National Advisory Council on Innovation and is a Member of the South African Academy of Engineering.
- **William Pick** was Professor of Community Health at the University of the Witwatersrand, and Acting President of the Medical Research Council.
- **Pragasen Pillay** is a Professor in the Department of Electrical & Computer Engineering and holds the Jean Newell Distinguished Professorship in Engineering at the Clarkson University, New York. He is a part-time Professor at the University of Cape Town.
- **Carl Wilhelm Irene Pistorius** is the Vice-Chancellor and Principal of the University of Pretoria. He is the Chairperson of the National Advisory Council on Innovation (NACI).
- **Petrus Christiaan Pistorius** is Head of the Department of Materials Science and Metallurgical Engineering at the University of Pretoria. Previously, he was President of the Corrosion Institute of Southern Africa.
- **Nyameko Barney Pityana** is Principal and Vice Chancellor of the University of South Africa. He is Chairperson of Higher Education South Africa and Chairman of the African Council for Distance Education. He was previously Chairperson of the South African Human Rights Commission.
- **Hans Jurgens Potgieter** is a retired Professor and Dean of Microbiology in the Faculty of Science at the University of the Free State.

- **Bernard Alexander Prior** is Professor of Microbiology and the former Chairman of School of Biological Sciences at the University of Stellenbosch. He was the Director of the UNESCO Industrial Biotechnology.
- **Otto Walter Prozesky** is an honorary Professor in Virology at Pretoria and Witwatersrand Universities. He was formerly the Director of the National Institute of Virology in Johannesburg, the Vice-Principal of the University of Pretoria, and President of the Medical Research Council.
- **Mapule F. Ramashala** is the Chair of the MRC and former Vice Chancellor of MEDUNSA.
- **Raj Ramesar** is Professor and head of the Division of Human Genetics at the University of Cape Town. He is also the Director of the MRC Human Genetics Research Unit, and CANSA's Colorectal Cancer Research Consortium.
- **Mamphela Aletta Ramphele** is the Chair of Circle Capital Ventures. She is a former Managing Director of the World Bank and former Vice-Chancellor of the University of Cape Town.
- **Michelle Ramsay** is Professor at the University of Witwatersrand and Head of the Molecular Genetics Laboratory in the Division of Human Genetics at the National Health Laboratory Services.
- **Douglas Eric Rawlings** is Professor and Head of the Department of Microbiology and Deputy Dean of the Faculty of Natural Sciences at the University of Stellenbosch. He was formerly a Professor of the Microbiology Department at University of Cape Town.
- **Batmanathan Dayanand Reddy** is Professor of Applied Mathematics and Director of the Centre for Research in Computational and Applied Mechanics, at the University of Cape Town. He has served as Dean of the Faculty of Science, at the University of Cape Town.
- **Priscilla Reddy** is Professor and Researcher at the Medical Research Council.
- **Carolus J. Reinecke** was Professor of Biochemistry and Vice-Chancellor, Potchefstroom University for CHE.
- **Linda Marleine Richter** is Executive Director of Child, Youth & Family Development at the Human Sciences Research Council and an Honorary Professor at the University of the Witwatersrand
- **Terence John Robinson** is a Professor of Zoology and Head of the Department of Botany and Zoology at the University of Stellenbosch. He was a research associate in Dr David Ledletter's laboratories at the Institute for Human Genetics, Baylor College of Medicine at the Texas Medical Centre in Houston.
- **Justus Christiaan Roux** is Professor of African Languages and Director of the Centre for Language and Speech Technology at Stellenbosch University. He has served as Director of an NRF-funded Research Unit in Experimental Phonology at Stellenbosch University.
- **Heinz Rüter** is Professor for Geomatics at the University of Cape Town. He was Head of the Department of Surveying at the University of Cape Town.
- **Edward Peter Rybicki** is a Professor in Microbiology in the Dept of Molecular and Cell Biology and Member of the Institute of Infectious Disease and Molecular Medicine at the University of Cape Town..
- **Roelf Feenstra Sandenbergh** is Professor and Dean of the Faculty of Engineering, Built Environment and Information Technology at the University of Pretoria.
- **Lawrence Schlemmer** is Executive Director of the strategic research company MarkData. He was Vice President of the HSRC, Professor and Director of the Centre for Policy Studies at the University of the Witwatersrand.
- **Mary Cathrine Scholes** is a Professor in the School of Animal, Plant and Environmental Sciences at the University of the Witwatersrand. She has worked at North Carolina State University, the National Centre for Atmospheric Research, Colorado State University and in the Amazon of Peru.
- **Robert J. Scholes** is a CSIR Fellow in the Natural Resources and the Environment division. He was a



leading participant in the 5-year international Millennium Ecosystem Assessment.

- **Casper Schutte** was Professor of Chemistry at the University of South Africa, and interim manager of the South African Bioinformatics Initiative.
- **J.R. 'Bob' Seretlo** is Professor Emeritus of Physics of the University of Fort Hare. He was Dean of the Faculty of Science at the University of Fort Hare.
- **Lawrence Vere Shannon** is a retired Honorary Professor of Oceanography. He was Director of the South African Sea Fisheries Research Institute (now Marine and Coastal Management).
- **John Francis Sharpey-Schafer** is a retired Nuclear Physicist attached to the Universities of Western Cape and Zululand. He was Director iThemba LABS.
- **Olive Shisana** is the President and CEO at the Human Science Research Council. She was Executive Director of the Social Aspects of HIV/AIDS and Health at the HSRC, Professor and Head of Department of Health Systems Management and Policy at MEDUNSA and DG of the Department of Health.
- **Sibusiso Sibisi** is CEO of the Council for Scientific and Industrial Research. He was Executive Director (R&D) at Plessey South Africa and Deputy Vice Chancellor for Research and Innovation, University of Cape Town.

- **W. Roy Siegfried** is Emeritus Professor at the University of Cape Town. He has served as Director of the Sir Percy Fitzpatrick Institute of African Ornithology.
- **Silvester Ron Simango** is a Senior Lecturer in the Department of English Language and Linguistics at Rhodes University. He taught at the University of the North (now the University of Limpopo) and the University of Malawi.
- **Ratnamala Singh** is Executive Director of the Higher Education Quality Committee, Council on Higher Education. She was Executive Director in the Division for Social Sciences and Humanities at the CSD and HSRC. She was Professor and Head of the Department of Philosophy at the University of Durban-Westville.
- **Beric William Skews** is Director of the Flow Research Unit at the University of the Witwatersrand. He was Manager of R&D at Eskom.
- **Hendrik Christoffel Snyman** is retired Emeritus Professor of Physics at the Nelson Mandela Metropolitan University and former Rector and Vice-Chancellor of the Port Elizabeth Technikon.
- **Himla Soodyall** is Associate Professor at Wits and the Director of the MRC/NHLS/Wits Human Genomic Diversity and Disease Research Unit at the National Health Laboratory Service & Wits University. She is a Principal Medical Scientist at the NHLS.

- **Theodor John Stewart** is Professor in the Department of Statistical Sciences at the University of Cape Town. He headed the CSIR's Division of Operations Research and Statistics and was Head of the Department of Statistical Sciences at UCT.
- **Pieter Streicher Steyn** is President of IUPAC, and Professor of Chemistry and Senior Director of Research (Science) at Stellenbosch University. He was Director of the Division of Food Science and Technology of the CSIR, Head of the SASOL Centre for Chemistry and SASOL Professor of Chemistry at Potchefstroom University.
- **Pieter Helenius Stoker** is Research Professor at the School of Physics, Potchefstroom Campus, North West University. He was head of Department of Physics, Potchefstroom University for CHE.
- **Rolf Heinrich Stumpf** is Vice Chancellor of the Nelson Mandela Metropolitan University in Port Elizabeth. He was President of the Human Sciences Research Council and served as Deputy Vice Chancellor at the University of Stellenbosch.
- **Chris F. Swanepoel** is Professor and Vice-Principal: Academic & Research at the University of South Africa.
- **Nthoana Tau-Mzamane** is former President and CEO of the Agriculture Research Council. She has served as the

Deputy Director-General and Head of the Department of Agriculture Land and Environment in Limpopo Province.

- **John Reginald Nuttall Taylor** is Professor of Food Science at the University of Pretoria. He was Head of the Food Science Department at the University of Pretoria.
- **Petro Terblanche** is Professor and Executive Director of the Technology and Innovation Directorate at the Medical Research Council of South Africa. She was formerly the head of the CSIR's Biochemtek division.
- **Jennifer Ann Thomson** is a Professor in the Department of Molecular and Cell Biology, UCT. She was Professor and Head of the Department of Microbiology, UCT; Director of the Laboratory for Molecular and Cell Biology, CSIR; and Associate Professor, Department of Genetics, WITS University.
- **Phillip Valentine Tobias** is Professor Emeritus and Honorary Professorial Research Fellow in the School of Anatomical Sciences, University of the Witwatersrand. He has been Honorary Professor at University of Pennsylvania, University of Vienna, University of Balearic Isles, Cambridge University, University of Florence, Andrew D. White Professor-at-Large, Cornell University and Director, Palaeo-Anthropology Research Unit/Sterkfontein Research Unit.
- **Peter Daughtrey Tyson** is Professor Emeritus, former Deputy Vice-Chancellor and Vice-Principal, Director of

the Climatology Research Group, University of the Witwatersrand. He has served as the Vice-President ICSU and the Chairman START Scientific Steering Committee.

- **Peter Christopher Julius Vale** is Nelson Mandela Professor of Politics and Head of the Department of Political and International Studies at Rhodes University. He was Director of Research at the SA Institute of International Affairs. He has been a Professor at Rhodes (twice) and at the University of the Western Cape.
- **Annél van Aswegen** is Director: Human Resources at the University of Pretoria. She was Acting Registrar: Professional Services and a member of the Executive at the University of South Africa.
- **Jan Horn van Heerden** is Professor and Head of Department of Economics at the University of Pretoria.
- **Willem Francois Petrus van Heerden** is Professor and Head of the Department of Oral Pathology and Oral Biology in the School of Dentistry at the University of Pretoria.
- **Paul David van Helden** is Professor and Head of Medical Biochemistry at Stellenbosch University. He is the Director of the MRC/US Centre for Molecular and Cellular Biology, and co-director of the DST Centre of Excellence in molecular tuberculosis research.
- **Anton Albert van Niekerk** is Professor of Philosophy and Director of the Centre for Applied Ethics and Head

of the Unit for Bioethics at the University of Stellenbosch. Previously, he was Chair of the Philosophy Department at Stellenbosch.

- **Frederik van Niekerk** is Institutional Director: Research, Innovation, Human Resources and Student Affairs for North-West University. He was previously Vice-Principal: Academic Affairs at the former Potchefstroom University.
- **Hendrik Christoffel Janse van Rensburg** is Director of the Centre for Health Systems Research & Development at the University of The Free State. Formerly, he was Head the Department of Sociology.
- **Johan van Staden** is Professor of Botany at the University of Kwazulu-Natal, and Editor of the South African Journal of Botany.
- **Johan van Wyk** was Professor of Electrical Engineering at the Rand Afrikaans University, and Dean of the Engineering Faculty.
- **Johan van Zyl** is Professor of Agricultural Economics and the Group Chief Executive Officer of Sanlam Limited. He was previously CEO of Santam and Vice-Chancellor and Principal at the University of Pretoria.
- **Daniel W. Verwoerd** is an Emeritus Professor of Virology, Agricultural Research Council-Onderstepoort Veterinary Institute.



- **Sibusiso Vil-Nkomo** is Professor and Executive Director: Institutional Advancement at the University of Pretoria; he has been Dean of Commerce at the same University.
- **Daniel Visser** is Professor, and has served as Head of the Department of Private Law and Dean of Law at the University of Cape Town.
- **Wilma Viviers** is the Director of the School of Economics, Risk Management and International Trade in the Faculty of Economic and Management Sciences at the North-West University (Potchefstroom Campus).
- **James Andrew Volmink** is Professor of Community Health in the Faculty of Health Sciences, Deputy Dean (Research) of the University of Stellenbosch and is Director of the South African Cochrane Centre of the Medical Research Council and the was Professor of Primary Health Care at the University of Cape Town.
- **Gerhard von Gruenewaldt** is Research Advisor to the Wits Foundation and a Consultant to the NRF. He was Vice-President of Foundation for Research Development.
- **Hester H. Vorster** is Professor and Research Director of the Africa Unit for Transdisciplinary Health Research, at the University of North-West.
- **Anthony David Mortimer Walker** is a Professor Emeritus (Physics) at the University of KwaZulu-Natal. He

is part time Director of Special Projects in the Research Office and Honorary Research Associate in Physics at the University of KwaZulu-Natal.

- **Brian Warner** is Distinguished Professor of Natural Philosophy at UCT. Previously he was Head of the Department of Astronomy at the same university.
- **Mark Charles M. Wentzel** is Professor with the Water Research Group in the Department of Civil Engineering at the University of Cape Town.
- **Patricia Ann Whitelock** has a joint appointment with the South African Astronomical Observatory and the University of Cape Town. She was Acting Director of SAAO.
- **Anna-Lise Williamson** is a Professor at the Department of Clinical Laboratory Service at the University of Cape Town.
- **Francis Wilson** is Professor Emeritus in Economics at UCT. He was for many years the Director of the Southern Africa Labour and Development Research Unit (SALDRU).
- **Brenda Wingfield** is a Professor in the Department of Genetics at the University of Pretoria and Programme Leader of the DST/NRF Centre of Excellence in Tree Health Biotechnology.
- **Michael Wingfield** is Professor and Director Forestry and Agricultural Biotechnology Institute, University of Pretoria. He is also the Director of the DST/NRF Centre

of Excellence in Tree Health Biotechnology and Tree Protection Co-operative Programme.

- **M. P. Wissing** is Professor, School for Psychosocial Behavioural Sciences at the University of North-West.
- **David Randle Woods** has been Vice-Chancellor of Rhodes University and was the Head of the Department of Microbiology and Director of the Microbial Genetics and Industrial Microbiology Research Unit at the University of Cape Town.
- **Hong-Kun Xu** is senior Professor at the University of KwaZulu-Natal. He has held visiting positions at the University of Seville, Spain, the University of Newcastle, Australia, the University of Calabria, Italy, Pukyong National University, Korea, and Tokyo Institute of Technology, Japan.
- **Alphose Zingoni** is Professor of Structural Engineering and Mechanics in the Department of Civil Engineering of the University of Cape Town. He was Dean of the Faculty of Engineering at the University of Zimbabwe.

# Annual financial statements

for the year ended 31 March 2006

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\*The supplementary schedule has been attached for information purposes only and does not form part of the audited financial statements.

## Approval of the annual financial statements

The financial statements set out on pages 2 to 10 have been approved by the members of Council and are signed on its behalf below:



**Prof Jonathan Jansen**  
Vice-President

## Report of the independent auditors to the members Academy of Science of South Africa

We have audited the annual financial statements of Academy of Science of South Africa set out on pages 2 to 9 for the year ended 31 March 2006. These financial statements are the responsibility of the members of Council, while our responsibility is to express an opinion on these financial statements based on our audit.

## Scope

We conducted our audit in accordance with International Standards on Auditing which require that we plan and perform the audit to obtain reasonable assurance that the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.



## Audit opinion

In our opinion, the financial statements fairly present, in all material respects, the financial position of the academy at 31 March 2006 and the results of its operations for the year then ended in accordance with its accounting policies.

## Supplementary information

The schedule set out on page 10 has been attached for information purposes only and is not covered by the audit opinion.

**Douglas & Velcich**

Chartered Accountants (SA)

Registered Accountants and Auditors

Johannesburg, 31 July 2006

## Balance sheet at 31 March 2006

	2006	2005
Note	R	R
<b>Assets</b>	<b>5 277 014</b>	<b>2 163 547</b>
<b>Non-Current assets</b>	<b>173 047</b>	<b>81 601</b>
Equipment	173 047	81 601
<b>Current assets</b>	<b>5 103 967</b>	<b>4 390 116</b>
Cash and cash equivalents	5 103 967	4 390 116
<b>Total assets</b>	<b>5 277 014</b>	<b>4 471 717</b>
<b>Reserves and liabilities</b>	<b>5 277 014</b>	<b>4 471 717</b>
<b>Reserves</b>	<b>3 695 368</b>	<b>3 845 962</b>
Accumulated fund	3 695 368	3 845 962
<b>Current liabilities</b>	<b>1 581 646</b>	<b>625 755</b>
Accounts payable	1 581 646	625 755
<b>Total reserves and liabilities</b>	<b>5 277 014</b>	<b>4 471 717</b>

## Income statement for the year ended 31 March 2006

	Note	2006 R	2005 R
<b>Income</b>		<b>4 592 481</b>	<b>2 948 713</b>
Grants received	4	4 048 448	2 547 000
Membership fees		40 367	45 861
Interest		238 846	156 038
Other income		1 663	–
Publication income		263 157	199 814
<b>Expenditure</b>		<b>4 743 075</b>	<b>2 508 773</b>
Audit fees		–	20 000
Advertising		50 493	–
Bank charges		5 998	1 075
Computer expenses		10 437	3 877
Communal expenses		130 561	–
Consensus study panel		4 037	–
Depreciation		25 495	13 967
Equipment rental		23 636	746

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from page 116 ...

General expenses	–	4 375
Honoraria	40 000	20 000
Insurance	1 224	–
Interest paid	–	4 059
Printing, stationery and advertising	623 229	271 921
Recruitment and training	8 812	–
Refreshments	23 612	–
Refund to The Ford Foundation	56 277	–
Rent, electricity and maintenance	115 905	161 717
Salaries and contributions	1 702 020	1 369 876
Security expenses	2 489	–
Seminars and conferences	152 403	24 326
Services levy	150 018	–
Subscription and resource documentation	5 175	350
Technical services	951 040	528 213
Telephone, faxes and postage	130 937	63 216
Travel and conference costs	529 277	21 055
<b>(Deficit)/Surplus for the year</b>	<b>(150 594)</b>	<b>439 940</b>

## Statements of changes in reserves for the year ended 31 March 2006

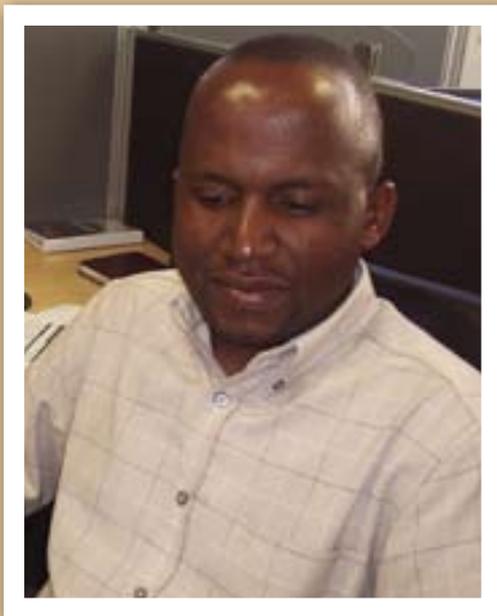
	Equipment fund	Accumulated funds	Total
	R	R	R
<b>Balance at 1 April 2004</b>	<b>53 054</b>	<b>3 352 968</b>	<b>3 406 022</b>
Surplus for the year	–	439 940	439 940
Transfer to accumulated funds	(53 054)	53 054	–
<b>Balance at 31 March 2005</b>	<b>–</b>	<b>3 845 962</b>	<b>3 845 962</b>
Deficit for the year	–	(150 594)	(150 594)
<b>Balance at 31 March 2006</b>	<b>–</b>	<b>3 695 368</b>	<b>3 695 368</b>



## Cash flow statement for the year ended 31 March 2006

	Note	2006 R	2005 R
<b>Cash flows from operating activities</b>			
(Deficit)/surplus for the year		(150 594)	439 940
Adjusted for: Interest received		(238 846)	(156 038)
Depreciation		25 495	13 967
<b>Operating (deficit)/surplus before working capital changes</b>		<b>(363 945)</b>	<b>297 869</b>
<b>Working capital changes</b>		<b>955 891</b>	<b>422 676</b>
Decrease in accounts receivable		–	2 510
Increase in accounts payable		955 891	420 166
<b>Cash generated by operations</b>		<b>591 946</b>	<b>720 545</b>
Interest received		238 846	156 038
<b>Net cash inflow from operating activities</b>		<b>830 792</b>	<b>876 583</b>
<b>Cash flows utilised in investing activities</b>		<b>(116 941)</b>	<b>(42 514)</b>
Acquisition of equipment, at cost		(116 941)	(42 514)
<b>Net increase in cash and cash equivalents</b>		<b>713 851</b>	<b>834 069</b>
<b>Cash and cash equivalents at beginning of year</b>		<b>4 390 116</b>	<b>3 556 047</b>
<b>Cash and cash equivalents at end of year</b>	<b>3</b>	<b>5 103 967</b>	<b>4 390 116</b>

## Notes to the financial statements for the year ended 31 March 2006



**Morakeng Malatji**

Financial Officer (part time)

### 1. Accounting policies

The financial statements are prepared on the historical cost basis, except for financial instruments as indicated below. The financial statements incorporate the following principal accounting policies which are consistent, in all material respects, with those applied in the previous year:

#### 1.1 Equipment and depreciation

Equipment is stated at cost less provision for depreciation. Depreciation is calculated to write off the cost of the assets on the straight line method over their expected useful lives at the following rates:

**Office equipment** – 15 % per annum

**Office furniture and fittings** – 15 % per annum

#### 1.2 Income

Income is brought to account as and when received

#### 1.3 Expenditure

Expenditure is accounted for on the accrual basis



## 1.4 Financial instruments

### *Measurement*

Financial instruments are initially measured at cost, which includes transaction costs. Subsequent to initial recognition, these instruments are measured as set out below:

### *Cash and cash equivalents*

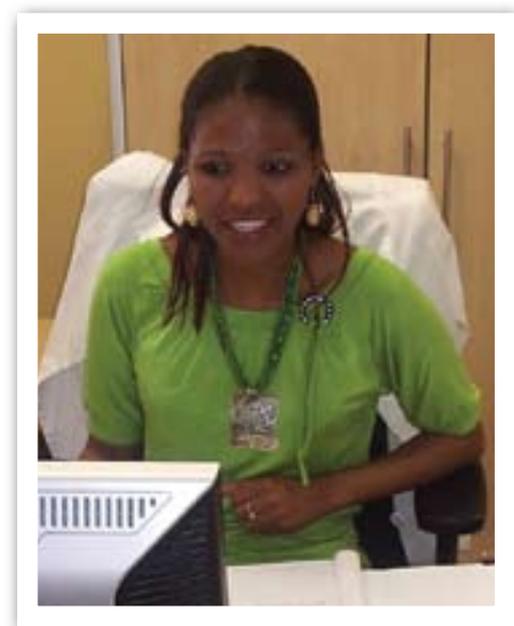
Cash and cash equivalents are measured at fair value.

### *Financial liabilities*

Non-derivative financial liabilities are recognised at amortised cost, comprising original debt less principal payment and amortisations.

## 1.5 Investment income

Interest is recognised on a time proportion basis, taking account of the principal outstanding and the effective rate over the period to maturity, when it is probable that such income will accrue to the academy.



**Fundiswa Kanise**

Office Administrator

## 2. Equipment

### 31 March 2006

#### Balance at 1 April 2005

At cost

Accumulated depreciation

Additions during the year

Depreciation for the year

#### Net book value 31 March 2006

At cost

Accumulated depreciation

### 31 March 2005

#### Balance at 1 April 2004

At cost

Accumulated depreciation

Additions during the year

Depreciation for the year

#### Net book value 31 March 2005

At cost

Accumulated depreciation

	Office furniture and fittings	Office equipment and computers	Total
	R	R	R
	<b>81 354</b>	<b>247</b>	<b>81 601</b>
At cost	106 253	389	106 642
Accumulated depreciation	(24 899)	(142)	(25 041)
Additions during the year	–	116 941	116 941
Depreciation for the year	(15 938)	(9 557)	(25 495)
<b>Net book value 31 March 2006</b>	<b>65 416</b>	<b>107 631</b>	<b>173 047</b>
At cost	106 253	117 330	223 583
Accumulated depreciation	(40 837)	(9 699)	(50 536)
	<b>52 749</b>	<b>305</b>	<b>53 054</b>
At cost	63 739	389	64 128
Accumulated depreciation	(10 990)	(84)	(11 074)
Additions during the year	42 514	–	42 514
Depreciation for the year	(13 909)	(58)	(13 967)
<b>Net book value 31 March 2005</b>	<b>81 354</b>	<b>247</b>	<b>81 601</b>
At cost	106 253	389	106 642
Accumulated depreciation	(24 899)	(142)	(25 041)



### 3. Cash and cash equivalents

	<b>2006</b>	<b>2005</b>
	<b>R</b>	<b>R</b>
Cash at bank	1 480 691	1 627 623
Cash on call	3 623 276	2 762 493
	<b>5 103 967</b>	<b>4 390 116</b>

### 4. Grants received

	<b>2006</b>	<b>2005</b>
	<b>R</b>	<b>R</b>
Department of Science and Technology	2 500 000	2 547 000
United States National Academies	1 371 975	-
Sydney Brenner Fellowship	126 110	-
InterAcademy Panel	30 248	-
The African Academy of Sciences	20 115	-
	<b>4 048 448</b>	<b>2 547 000</b>

## 5. Taxation

The academy is in the process of applying for exemption from income tax under section 10(1)(cn) as read with Section 30 of the Income Tax Act.

## 6. Going concern

The existence of the academy is dependent on the continued support of its donors, by way of grants. Should the grants be withdrawn it is highly unlikely that the academy will be able to continue as a going concern. Donors have agreed to continue supporting the academy in 2006/2007 financial year.

## 7. Financial instruments

### 7.1 Currency risk

The academy is exposed to currency risk to the extent that grants are received by the academy in foreign currency.

### 7.2 Interest rate risk

The academy is exposed to interest rate risk, as it places funds at both fixed and floating interest rates. The risk is managed by maintaining an appropriate mix between fixed and floating rates and placings within market expectations.

### 7.3 Credit risk

The academy's credit risk is attributable to liquid funds. The credit risk on liquid funds is limited because the counter party is a bank with credit rating assigned by international credit-rating agencies. The academy has no significant concentration of credit risk.



### 7.4 Liquidity risk

The academy manages liquidity risk by monitoring forecast cash flows and ensuring that adequate cash reserves are maintained.

### 8. Comparative figures

Comparative figures have been restated to facilitate improved disclosure.



## Supplementary schedule: Income and expenditure for the year end 31 March 2006

	ASSA	SAJS	SAJQ	SAJR	USGE	USIN	BFRE	EMLH	TOTAL
	R	R	R	R	R	R	R	R	R
<b>INCOME</b>									<b>4 592 481</b>
Dept. of Science and technology									2 500 000
United States National Academies									1 371 975
The African Academy of Sciences									20 115
InterAcademy Panel									30 248
Sydney Brenner Fellowship									126 110
Interest received									238 846
Membership fees									40 367
Other income									1 663
Income from publications - SAJS									263 157
<b>LESS: UNALLOCATED EXPENDITURE</b>									<b>81 772</b>
Depreciation									25 495
Refund to Ford Foundation									56 277
<b>LESS: ALLOCATED EXPENDITURE</b>	<b>1 392 064</b>	<b>1 049 952</b>	<b>793 184</b>	<b>448 170</b>	<b>770 441</b>	<b>188 412</b>	<b>5 680</b>	<b>13 400</b>	<b>4 661 303</b>
Advertising marketing and recruitment	50 493	-	-	-	-	-	-	-	50 493
Bank charges	2 103	3 024	-	-	722	149	-	-	5 998
Communal expenses	-	-	-	-	88 377	42 184	-	-	130 561
Computer requisites	6 294	3 573	-	250	320	-	-	-	10 437
Conferences seminars and awards	28 131	-	-	-	124 272	-	-	-	152 403
Consensus study panel	-	-	-	-	4 037	-	-	-	4 037
Equipment rental	611	23 025	-	-	-	-	-	-	23 636
Honoraria	40 000	-	-	-	-	-	-	-	40 000
Insurance	1 224	-	-	-	-	-	-	-	1 224
Printing and stationery	49 584	234 189	324 645	-	14 811	-	-	-	623 229
Recruitment and training	-	8 812	-	-	-	-	-	-	8 812
Refreshments	17 608	-	-	627	5 377	-	-	-	23 612
Rent electricity and cleaning	110 501	5 404	-	-	-	-	-	-	115 905
Resource centre documentation	-	-	-	-	4 325	-	-	-	4 325
Salaries	748 169	521 575	11 531	77 647	245 094	90 843	5 542	1 619	1 702 020
Security expenses	2 489	-	-	-	-	-	-	-	2 489
Service levy	42 161	14 764	21 613	12 817	47 479	10 665	138	381	150 018
Subscription fees	850	-	-	-	-	-	-	-	850
Technical services	23 532	221 689	349 169	345 250	-	-	-	11 400	951 040
Telephone and postage	32 619	12 072	86 226	20	-	-	-	-	130 937
Travel accommodation and subsistence	235 695	1 825	-	11 559	235 627	44 571	-	-	529 277
<b>(DEFICIT)</b>									<b>(150 594)</b>



## ASSAf staff contact details

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<b>Neville Pritchard</b>	Quest Production Manager (part-time)			





# Strategic management of science journals in South Africa

