

G SCIENCE EDUCATION, LIAISON & INFORMATION DIVISION

Head of Division: P Martinez

The Science Education, Liaison and Information Division is charged with accomplishing one of the SAAO's mission goals, which is "to educate and inform the community". During the period under review, the Library was transferred to this Division. The Division's staff during 2001 comprised I Bassett, C Jacobs, D Laney, E Lastovica, P Martinez, T Medupe and C Rijdsdijk. At the end of January 2002, Ethleen Lastovica retired after 23 years of service at the SAAO. Ms Shireen Davis joined the Division in November 2001, and became SAAO Librarian on 1 February 2002. The Division was supported by numerous members of SAAO staff from other Divisions, most notably D Cooper, F Marang, E Romero Colmenero and F van Wyk. In addition, Ms S van der Merwe was employed as a Sutherland tour guide on a contract basis until the end of March 2001.

G1 HIGHLIGHTS

The main thrusts of the Division's activities during 2001 were the promotion of awareness of SALT, and the development of plans and exhibits for visitor centres at Sutherland and Cape Town, together with the nascent interest in astronomy at the University of the North West. Good progress was made on the development of the design for the Sutherland Visitor Centre, to the point of producing cost estimates of sufficient accuracy for fund-raising purposes.

The presentation of workshops for teachers and learners continued to be a key component of SAAO education initiatives at primary and secondary level. Over 80 workshops for nearly 3 280 learners were presented. In March, C Rijdsdijk organised numerous workshops at the annual SASOL SciFest in Grahamstown. Nearly all the workshops were fully booked. The resources developed for these workshops are highly regarded and widely used. The SAAO also continued its efforts to reach schools in remote or underprivileged areas. Fewer "Starbus" visits were made this year, due to staff limitations. Visits were made to selected schools in the Eastern Cape, Northern Cape and Western Cape.

Public interest in SALT and astronomy continued to increase, and a number of expected and unexpected

astronomical events drew both the print and broadcast media as well as thousands of queries from interested persons. SAAO staff handled 4 541 queries from the public during the 15 months under review. SAAO or SALT were mentioned in print in 292 articles. Popular articles published in South Africa are well accounted for, but many articles in overseas publications would have gone unrecorded. Using a metasearcher with advanced search capabilities to find mention of the Southern African Large Telescope on the web, over 800 pertinent hits were registered. As expected, many referred to the SAAO or SALT websites, but sites maintained by NRF, the South African government, press and news agencies, newspapers and on-line journals, universities in South Africa and abroad, and astronomical sites, provided some mention of SALT. SAAO received 4 399 visitors in Cape Town and Sutherland during the period under review. A total of 18 open nights were held at these two locations. These visitor figures are comparable with those of the previous reporting period. It should be emphasised that there is potential for substantial growth in these figures, judging from the pressure for visits to the Observatory outside of the standard tour times, especially in Sutherland. To satisfy this demand, a full-time education officer will be appointed at Sutherland. This person will also teach science lessons at the local schools to alleviate the critical shortage of trained science teachers in the area.

SAAO continues to enjoy good relations with amateur astronomers. The Cape Centre of the Astronomical Society of Southern Africa meets at SAAO Cape Town once a week. The Society's members assist with open nights in Cape Town and Sutherland. Cape Town amateur astronomer C de Villiers continued a programme of measuring sparsely observed southern hemisphere visual binaries using the McClean Telescope.

The solar eclipse on 21 June 2001 provided a rare opportunity to draw large numbers of visitors to SAAO in the daytime. SAAO Cape Town hosted around 250 visitors during the eclipse who used several telescopes on the grounds. SAAO staff also offered an eclipse viewing opportunity to Sutherland residents in the streets, thus "bringing the Observatory to the Town." Interest in this event rapidly picked up from the end of 2000, and by January 2001, many tour operators were beginning to request details of the eclipse. Press releases were issued, numerous TV, radio and newspaper interviews were given by SAAO staff and a "Friends with the Universe" workshop manual was produced. The SAAO homepage was specially adapted

to accommodate the extra enquiries and proved to be extremely popular. A review article on eclipses, written by C Rijdsdijk, was published in the on-line journal "Science in Africa" where it received many "hits".

G2 VISITOR CENTRES

The principal goal of the Division over the next few years is the construction of a Visitor Centre at Sutherland as part of the SALT Collateral Benefits Plan. A secondary goal is to improve the visitor facilities in Cape Town and to foster linkages with the Planetarium and MTN ScienCentre through public lectures and demonstrations, workshops for teachers, etc. The focus of activities during the period under review was on developing the Sutherland Visitor Centre concept.

G2(a) Sutherland

The SAAO Sutherland Visitor Centre is intended primarily as a facility to make SALT/SAAO and

astronomy accessible to the public. To maximize the collateral benefits associated with the construction of the Visitor Centre at SAAO Sutherland, the town of Sutherland is an integral part of the planning and development process. An outcome of this collaboration was the decision to develop an Activity Centre in the town of Sutherland, in parallel with the development of the Visitor Centre at the Observatory, some 18 km away.

Following the Architectural Ideas Competition held in 2000, Jane Visser Mark Thomas Architects were requested to develop their winning design concept for the Visitor Centre to the point of producing cost estimates adequate for fundraising purposes. The firm, Architects Associated was requested to develop their concept for the Activity Centre for similar purposes. These studies were financed from the Local Economic Development Fund grant of R1.35M, made jointly to Sutherland Council and SAAO in 2000. The preliminary cost reports were produced in November 2001. The results of these cost reports were used to give an indication of the scope

SAAO Public Awareness Statistics 2001/2002

2001–2002	QUERIES		In the News				Press Releases	Broadcast Media		Legal Queries
	* Quick	** 10 min+	SAAO Brief	SAAO Feature	SALT Brief	SALT Feature		Radio	TV	
Jan 01	140	11	16	1	2	-	2	8	-	-
Feb 01	105	15	8	-	3	1	2	4	-	-
Mar 01	70	19	6	1	1	1	2	9	-	-
Apr 01	164	23	5	2	1	3	1	6	1	-
May 01	271	27	17	22	-	2	3	4	-	1
Jun 01	503	60	26	28	8	4	3	22	2	2
Jul 01	210	113	9	3	4	5	3	11	-	2
Aug 01	361	27	6	4	2	4	3	4	-	-
Sep 01	331	19	1	2	-	4	1	5	-	-
Oct 01	388	33	2	6	2	3	3	5	-	1
Nov 01	308	26	4	3	1	1	3	6	2	-
Dec 01	311	19	6	3	10	4	2	7	-	-
Jan 02	306	22	3	6	5	9	4	5	-	-
Feb 02	307	19	3	6	2	2	1	4	-	3
Mar 02	317	16	5	3	1	-	1	7	1	2
TOTAL	4092	449	117	90	42	43	34	107	6	11

- *Queries answered immediately (under 10 min) ** Queries requiring more than 10 min research.
- "In the News" indicates the number of articles published in the popular press or general scientific literature that mention SALT, SAAO or its staff.
- SAAO subscribes to a news service, News Clip, who provides a good coverage of articles on SAAO or SALT that are published in SA print media.
- There are sure to be many articles that appeared in the overseas press for which we have no record.
- 207 articles mentioned SAAO, 85 mentioned SALT. Total of 292 articles recorded.
- The figures for Radio & TV above are for interviews given by staff.
- SAAO & SALT featured many times on the broadcast media in 2001/2002 but there are no stats.

of the project to several potential stakeholders.

A meeting of science centre development experts and SAAO staff was held in May 2001 to discuss fundraising and operational issues regarding the proposed Visitor Centre in Sutherland. The appropriateness, potential problems and needs of the winning design concept were reviewed and discussed.

To visualise the designs of the Visitor Centre and Activity Centre, and to assist with fundraising activities, a computer-rendered visualization of these structures was commissioned from the company Silverline Multimedia in February 2002. This presentation has been shown to various officials in the Northern Cape legislature, and parts of it were also shown in an SABC TV documentary in the “Focus with Freek” series. The programme focused on SALT and associated developments in Sutherland.



Computer-rendered illustration of the proposed design concept for the Visitor Centre at SAAO Sutherland.

To be able to accommodate the increasing numbers of visitors until the Visitor Centre is built, D Laney, E Lastovica and C Rijdsdijk devised and costed a programme of improvements to the reception area and adjoining rooms in the Technical Building at SAAO Sutherland. The aim is to create an inviting interim visitor facility that gives a sense of the scientific and astronomical environment and its application at SAAO.

G2(b) Cape Town

The main thrust with regard to visitor facilities in Cape Town revolved around collaborations with the MTN ScienCentre and the SA Museum. SAAO provided a number of exhibits on loan to these two institutions at various times during the year. In the run-up to the eclipse, C Rijdsdijk presented a series

of four talks at the MTN ScienCentre, culminating in an explanation of eclipses on the day of the eclipse. He then used a telescope on the MTN ScienCentre roof to show the eclipse to the Minister of Arts, Culture, Science and Technology, Dr B Ngubane, the CEO of the Foundation of Education, Science and Technology, Dr A Pouris, the director of the MTN ScienCentre, Prof M Bruton, about 50 other dignitaries and some 500 members of the public and schoolchildren.

Statistics for education and public visits to SAAO Jan 2001 – March 2002

Education	Groups	No.
Day Visitors	52	4399
School Visits/Workshops	84	3277
Open Nights	18	638
Totals	154	8314

G3 EDUCATIONAL LIAISON & RESOURCE DEVELOPMENT

During this extended reporting period, 84 school groups visited SAAO, and SAAO staff also visited a number of schools. With the implementation of the Grade 8 part of Curriculum 2005 (which includes astronomy), there has been a great deal of interest in the teaching resources developed at SAAO. In addition to visiting numerous Cape Town schools to present workshops throughout the year, SAAO staff also made “Starbus” visits to schools further afield in Arniston, Beaufort West, Clanwilliam, Sutherland and Grahamstown.

During this extended reporting period C Rijdsdijk attended and presented workshops at the National Science Festival, SASOL SciFest, held in Grahams-town. In both March/April 2001 and March 2002, he presented numerous workshops, most of which were fully booked. In addition, he was active in setting up the “Science Olympics” at SciFest, as well as presenting demonstrations for the daily Sunset Shows.

In spite of the fact that the festival was held partly during the school holidays in 2001, attendance again showed an increase, with an attendance of around 50 000 learners, teachers and parents. Particularly noteworthy is the changing visitor profile: smaller groups from further afield are attending, and weekends are becoming a sort of family day. This trend continued at the 2002 SciFest, attendance rising again, this year reaching about 60 000. The visitor profile continues to

change, with some learners from Sutherland High School winning one of the “Science Olympics”! A display by the University of Cape Town used an SAAO computer-controlled 10-inch Meade telescope to view the Sun. This proved to be a popular addition to the UCT exhibit, which won the first prize at the festival.

As was the case in the past, new teaching resources were developed and older ones upgraded. Many of the workshop materials are now made of ‘pre-punched’ cardboard so that little classroom time is lost in cutting out the materials. A microscope kit and a sundial have been added to the extensive list of workshop modules, both of which have proved to be popular.

The “Starbus” no longer has the funding or staff to operate continuously as originally envisaged. It is, however, still very much in use when SAAO presents workshops in remoter areas away from SAAO Cape Town. C Rijdsdijk presented a series of workshops for in-service teacher training for the Western Cape Education Department in Clanwilliam, Arniston and Beaufort West. Similar workshops were conducted for the Institute of Maths and Science Teaching at the University of Stellenbosch, IMSTUS. These types of workshops reflect the emphasis of the SAAO's Science Education Initiative. By targeting teachers, the SAAO is able to optimize such capacity as it has in supporting science education in the country.

Another significant event was the formation of STARTEC, the *State of the Art Telescope Education Collaboration*. This was an initiative by S Preston (McDonald), co-organized by C Rijdsdijk. The formative workshop was held at SAAO from 16–20 February 2001 and attended by senior Education and Public Outreach (EPO) representatives from many of the world's leading astronomical facilities including J Alonso and D Altschuler (Arecibo), F Cianciolo, M Kay-Hemenway and S Preston (McDonald/HET), P Michaud (Gemini/Subaru), I Morison (Jodrell Bank), T Teays (STSci/Origins Education Forum), L Cuesta Crespo (IAC/GTC), D Finley (VLA) and R M West (ESO/VLT).

On 18 February 2001 the “Cape Declaration” was signed, committing these facilities to establish a forum to enhance their individual EPO activities and better carry the excitement of astronomy and space science to a wider audience throughout the world. The second STARTEC meeting was held at Arecibo on 7–8 December 2001, at which each delegate presented a short proposal on how

STARTEC should proceed. C Rijdsdijk was selected to chair STARTEC until the next meeting in September 2002.

SAAO has also been involved in many additional EPO activities:

- Helping with the setting up of the “Permission to Dream”, PtD, programme at two local schools. Fezeka High School and Ysterplaat Primary School were selected by the PtD team to receive two small telescopes and become part of an international team of schoolchildren to study the moon and report their findings to a central data collection centre. To facilitate this, each school will also receive a computer centre, sponsored by Rotary International.
- Interacting and supporting a group of UCT science students who run a programme called “Activ Science” for township children.
- As more and more “Science Centres” are established around South Africa, the SAAO is increasingly called upon to assist with the conceptual design of astronomical exhibits such as planetary highways, sundials, etc.
- Teaching resources are being developed in collaboration with the Western Cape Primary Science Project, PSP. One exciting aspect of this is that it is the first positive spin-off from STARTEC in that STSci has kindly donated 1 000 sets of solar system playing cards that are being incorporated into a game that can be used as a classroom resource in Khayelitsha primary schools.

SAAO maintains close links with many educational and professional organizations: C Rijdsdijk is on the Advisory Councils of both SASOL SciFest and IMSTUS, heads the Education group of the SAIP, serves on the Local Area Committee of the Natural Science Learning Area for curriculum development, is a member of the Standards Generating Body, SGB, for the FET band of Curriculum 2005, is Chairman of the National Science Olympiad setting committee, secretary and in-coming vice-president of the ASSA and is on the scientific organising committee for the IAU Commission 46 Special Session on Education for the General Assembly in Sydney in 2003.

G4 THE LIBRARY

The SAAO library is the national library for astronomy and astrophysics, and provides access to astronomical information, not only to SAAO staff,

but also to students and researchers from the broader national and international scientific community. The main holdings of the library are housed at SAAO Cape Town, with a selection of duplicate journals and books available at SAAO Sutherland. The library also occasionally serves as an in-service training library for librarianship students, although no such students were employed during the period under review.

Through the initiative of Dr Chris Sterken (VUB), the Flanders-South African Bilateral Agreement provided \$1 000 for the purchase of 21 books on the history of astronomy and science. The stipulation was that the titles selected should be beyond the reach of the annual SAAO library budget.

The SAAO library was able to contribute to the Harvard University Library Preservation Center's project to preserve endangered materials from the 19th and early 20th century observatory publications. SAAO lent them some volumes of the Helwan Observatory Bulletin and early volumes of the Royal Observatory, Cape of Good Hope Observations for microfilming. The supplied material was unavailable elsewhere.

A set of SAAO Circulars was sent to Guenther Eichhorn at the Smithsonian Astrophysical Observatory so that they could be scanned for inclusion on the NASA Astrophysics Data System (ADS). Many will welcome this because, although the Circulars were an in-house publication, the basic research published in them is still much in demand by astronomers worldwide.

There were ongoing discussions during the year led by Robyn Arnold of the Science and Technology Policy Group at NRF on the "Promotion of Access to Information Act 2 of 2000" and its application at NRF and the National Facilities. In August, Ethleen Lastovica, as the SAAO Information Officer appointed in terms of the Act, attended a 4-day course on the interpretation of the Act at the College of Justice in Pretoria.

SAAO librarian, Ethleen Lastovica, retired at the end of January 2002 after 23 years of service to SAAO. To ensure continuity, S Davis was appointed to the Division in November 2001, and took over as SAAO librarian on 1 February 2002. S Davis comes to SAAO after completing her Masters of Business Information Technology (Information Management) in Australia.

For much of the year under review, C Jacobs acted as Library Assistant responsible for incoming mail and journal control. For a month while the librarian

was on vacation, he was in charge of the day-to-day running of the library.

The financial year ended with the library budget severely stretched due to the severe devaluation of the South African Rand in late 2001. In particular the cost of journals increased dramatically, necessitating urgent attention to this matter during the next financial year.

G5 THE MEDIA

Thirty-four press releases were issued during the year on topics such as SALT developments, planetary alignments and a variety of other sky events. There is no doubt that SALT has caught the public imagination. Any press release on SALT generates many articles in the press, the broadcast media and on the web. The monthly column by C Rijdsdijk in the *Cape Argus* continues to receive good support from the public. Occasional radio interviews with J Richards on the SABC have developed into a regular weekly feature that is becoming very popular. Each interview lasts about 4 minutes and the topic is usually centered on a recent news event or item of general interest. Without professional monitoring of the broadcast media, it is impossible to provide figures for the coverage that SAAO or SALT are afforded in this direction, but we suspect it to be high.

The death of Dr Alan Cousins on 11 May 2001, just short of his 98th birthday, attracted world-wide attention. This resulted in many requests from the media and scientific institutions, here and abroad, for material about and photographs of a man who left his imprint on 20th century astronomy. The publication in February 2002 of the NRF Board's decision to develop the African Institute of Space Science concept also attracted much attention in the press and radio.

G6 ASTRONOMY AT THE UNIVERSITY OF THE NORTH WEST

The University of the North West (UNW) is an historically black university (HBU) situated in Mmabatho, the capital of the North West Province, South Africa. Until very recently UNW, like most HBUs, has had little opportunity to develop the infrastructure required to support scientific research. T Medupe (SAAO), an astronomy graduate from UCT, was born in Mmabatho and is

highly-motivated to introduce astronomy and to nurture an interest in research at his home-town university. At the same time, SAAO is strongly aware of the need to develop a much more wide-spread interest in astronomy, particularly among the previously disadvantaged communities in order to realise the research and collateral potential of SALT.

The Theoretical Astrophysics Programme (TAP) of UNW is a collaboration between the UNW and the SAAO. The current members of TAP are T Medupe, C Pooe, S Makgamathe, F Vuthela, L Ramokgali and F Kgokane. Here we report on SAAO-supported activities that took place at UNW during 2001 and the early part of 2002.

G6(a) Research Activities

In 2001, three MSc students, R Seshabela, B Moalusi and F Vuthela, participated in the research activities of TAP. R Seshabela and F Vuthela studied the pulsation of the star HD 75425 with multi-colour photometry and spectroscopy. B Molausi participated in a multi-site campaign on the roAp star HD 99563. All three students were co-supervised by G Handler (SAAO) and T Medupe (SAAO/UNW). Unfortunately two of these students withdrew from TAP towards the end of 2001. In early 2002, L Ramokgali joined TAP as a new MSc student, working on SdB pulsators under the co-supervision of R Stobie (SAAO) and T Medupe (SAAO/UNW). C Pooe, of the mathematics department at UNW joined TAP as the deputy leader in order to ensure smooth running of TAP when the group leader, T Medupe is in Cape Town.

G6(b) Visitor Programmes

C McGruder (Kentucky) visited TAP in September 2001. During this time, he presented two public lectures that were very well received, one on the "The history of participation of African-Americans in physics research", and another on "Life in the universe". A collaboration agreement between TAP and the Western Kentucky astronomy department was discussed. This led to an agreement to provide TAP with data from a network of robotic telescopes called *STARBASE* aimed at searching for planets in other stellar systems. *STARBASE* stands for "Students Training for Achievement in Research Based on Analytical Space-Science Experiences" and will in-

volve student training in undergraduate research. Such data will also contain photometry of stars that might be variable. Since TAPs research area is in variable stars, TAP students will search for variable stars in the data to be received from the University of Western Kentucky. The data transfer will commence once all the telescopes in the network are in operation.

In October 2001, TAP hosted C Impey (Arizona) for two weeks, during which time he presented formal lectures on cosmology to TAP students. He also presented a public lecture on cosmology.

G6(c) Participation in International Conferences and Meetings

At the invitation of the organisers of a solar eclipse workshop in Zambia, F Vuthela and B Moalusi visited Zambia where they participated in outreach programmes. R Seshabela attended the Vatican Summer School in Castel Gandolfo, Italy in July 2001.

G6(d) International Conference on Magnetic Fields in O, B and A Stars : Origin and Relation to Pulsation, Rotation and Mass Loss

In November 2001, it was decided by TAP and the physics department of the UNW to host an international conference to celebrate and strengthen TAP. The idea was supported by SAAO. The scientific organising committee consists of leading international stellar astronomers. The NRF has demonstrated its approval and support by contributing R50 000 towards the funding of the conference. The conference will be held at the UNW in Mmabatho from 27 November to 1 December 2002.

G6(e) TAP and NASSP

The National Astrophysics and Space Science Programme (NASSP) will be launched in 2003 (see section H4) as a joint effort by several South African universities, SAAO, HMO, HartRAO and iThemba LABS. The University of North West is part of the NASSP consortium with TAP as its representative in NASSP. TAP endorses NASSP and has undertaken to train all of its honours and MSc students at NASSP. TAP will also provide lectures at NASSP.

G7 SUMMER SCHOOL IN ASTRONOMY

Each year the SAAO offers a Summer School in Astronomy to undergraduate students in the final or penultimate year of their studies. Applications are received for many more places than are available. Students are selected on the basis of academic merit and on demographic and geographical representivity considerations.

G7(a) Summer School 2001

The 2001 Summer School was attended by seven students from 5 different universities.

Aveer Ramnath, *Witwatersrand University*
 Jaco van Dyk, *University of Pretoria*
 Cecilia Lombard, *University of Pretoria*
 Ntombikazi Mhlauli, *University of Fort Hare*
 Babalwa Nombexeza, *University of Fort Hare*
 Pascal Motsoasele, *University of Cape Town*
 Gerhard le Roux, *University of Stellenbosch*

Aside from interaction with their supervisors, the students received numerous formal lectures aimed at informing them about current research activities across a wide spectrum of astronomy in South Africa. SAAO is grateful to researchers from the University of Cape Town, Potchefstroom University and HartRAO for their contribution to this part of the Summer School. The following lectures were given at the 2001 Summer School:

E Lastovica. The library
V Kazie-Ravat. Computing at SAAO
C Rijdsdijk. Introduction to the universe
D Laney. The structure of the stars
S Potter. Stellar evolution
P Whitelock. The Milky Way
J Caldwell. Galaxies
SALT Team. SALT I, SALT II & SALT III
M Feast (UCT). Measuring distances to galaxies
D Kilkenny. Binary stars
P Martinez. roAp stars
G Handler. Stellar pulsation
E Romero Colmenero. Active galactic nuclei
A Fairall (UCT). Large scale structures and cosmology
P Woudt (UCT). Unveiling galaxies behind the Milky Way
T Medupe. Seismology of the sun
D O'Donoghue. The endpoints of stellar evolution
J Van der Walt (Potchefstroom). Molecular clouds; The basic physics of star formation and observational results on the early stages of star formation

B Warner (UCT). Cataclysmic variable star
D Buckley. Astronomical instruments
G Nicholson (HartRAO). Radio astronomy I and II

G7(b) Summer School 2002

The 2002 Summer School was attended by fifteen students, from 11 different universities. In common with international trends, South Africa is experiencing a dearth of students in physics, the traditional source of astronomy students. For the 2002 Summer School, Mathematics and Computer Science students were included in the target group as an experiment to assess the suitability of these students for careers in astronomy. Another feature of the 2002 Summer School was greater representation by students from SADC countries. The Summer School provides a unique opportunity for SADC students to be exposed to astronomy as a career choice.

Thembinkosi Shabalala, *University of Natal, Pmb*
 Roelf Botha, *Potchefstroom University*
 Retha Pretorius, *University of Pretoria*
 Mcedisi Sontjane, *University of the North West*
 Bongani Majeke, *Port Elizabeth University*
 Ziyanda Sigcau, *Transkei University*
 Buyisiwe Sondezi, *Vista University (Soweto)*
 Zulaigha Ismail, *University of Cape Town*
 Lebogang Netsianda, *University of Durban-Westville*
 Lesego Ramokgali, *University of the North West*
 Teddious Mhizha, *Zimbabwe University*
 Senooe Mohapi, *Lesotho University*
 Nicolas Thantsha, *University of Natal, Pmb*
 Emmanuel Nahayo, *Namibia University*
 Obed Tshenje, *University of the North West*

Attendance at formal lectures continued to be a strong component of the 2002 Summer School. However, this time the lecture programme was characterised by a broader participation of university lecturers.

E Lastovica. The library
V Kazie-Ravat. Computing at SAAO
C Rijdsdijk. Introduction to the universe
D Laney. The structure of the stars
S Potter. Stellar evolution
D O'Donoghue. The endpoints of stellar evolution
P Whitelock. Galaxies
D Buckley. Astronomical instruments
J Menzies. Extrasolar planets
SALT Team. SALT I, SALT II
P Martinez. Pulsating stars
E Romero. Introduction to AGN

B Warner (UCT). Cataclysmic variable stars
S Vrielmann (UCT). Astro-tomography
C Cress (University of Natal, Pmb). Gravitational lensing; Modelling the universe
A Fairall (UCT). Large scale structures and cosmology
P Woudt (UCT). Unveiling galaxies behind the Milky Way
J van der Walt (Potchefstroom). Molecular clouds; Basic physics of star formation; and observational results on the early stages of star formation
M W Feast (UCT). Measuring distances in the universe
Prof G Ellis (UCT). Cosmology today
D Kilkenny. Binary stars
B Woermann (HartRAO). Radio Astronomy
F Frescura (HartRAO). Pulsars

SAAO is grateful to researchers from UCT, Natal Pmb, Potchefstroom and HartRAO and also to the SALT team for their contributions to the 2002 Summer School.

G7(c) Summer School – General

The SAAO Summer School continues to be popular with students. Students generally find the experience of living and working together for a month instructive and rewarding. Each year comments and suggestions are received from students and incorporated in future Summer Schools, to the extent possible. With the advent of the NASSP postgraduate training programme, the Summer School is evolving into a recruiting and advertising platform for NASSP. In future years, the Summer School is likely to target students who have completed their second-year studies, as these students have generally not yet committed themselves to a particular honours programme, and may therefore enter into the NASSP programme.

G7 POSTGRADUATE STUDY PROGRAMME

N Mhlahlo started research towards a PhD on cataclysmic variables under the supervision of S Potter (SAAO), D Buckley (SALT) and B Warner (UCT). Soon after starting, he was awarded the Sainsbury/Linbury Trust Fellowship which will cover his expenses for two years of study at SAAO/UCT and one year in the UK at Bristol, Sheffield or Oxford University.

Three students completed their MSc theses and were awarded their degrees during the reporting

period, two in engineering and one in astronomy. N Sessions wrote a thesis entitled “An Investigation into the Fibre Instrumentation Feed for the Southern African Large Telescope” for the UCT Department of Engineering; he was co-supervised by D Buckley (SALT) and B Reed (UCT). R van Rooyen wrote “The Automated Detection and Analysis of Gravitational Microlensing Events” for the Engineering Department at Stellenbosch University; she was co-supervised by J Menzies (SAAO), B Herbst and D Weber (Stellenbosch). The title of C Peter's thesis was “Red Clump Stars as a Distance Indicator: Review and Application”; he was co-supervised by J Menzies (SAAO) and B Warner (UCT).

Three UNW students started studies towards an MSc: R Seshabela, B Moalusi and F Vuthela, jointly supervised by R Medupe (SAAO/UNW) and G Handler (SAAO). R Seshabela and F Vuthela had a project to study the pulsation of HD 75425 using multi-colour photometry and spectroscopy. B Moalusi's project involved a multi-site campaign on HD 99563 in order to look for more pulsation frequencies and to study frequency spacings. Unfortunately R Seshabela and B Moalusi withdrew from the programme towards the end of 2001.

A fourth UNW student L Ramokgadi started on an MSc early in 2002, with a project on “The Stability of Oscillations of sdB Pulsators”, co-supervised by R Stobie (SAAO) and T Medupe (SAAO/UNW).

C Blackman (UCT) started work on her PhD developing statistical tests for an objective analysis of Quasi-Periodic Oscillations (QPOs) in Dwarf Novae under supervision of B Warner (UCT) and C Koen (SAAO).

P Vermaak (UCT) continued his PhD research on extra-solar planets at the University of Natal, Pietermaritzburg, under the joint supervision of J Menzies (SAAO) and B Warner (UCT).

D Wood (Pretoria) commenced his MSc research on the application of genetic and evolutionary algorithms for optimisation of cyclotron models to polarimetric observations. His work is being co-supervised by S Potter (SAAO) and A Groenwold (Pretoria).

P Martinez (SAAO) is serving as an external supervisor for PhD students S Joshi (Uttar Pradesh) and V Girish (ISRO), who are both working in the area of rapidly oscillating Ap stars.

G8 LIAISON WITH COUNCIL OF SUTHERLAND

In 1999, the Council of Sutherland and SAAO entered into a Cooperation Agreement for the “present and future technological, astronomical, educational and socio-economic development of Sutherland.” The first fruits of this initiative were realised in October 2000 with the award to Sutherland and SAAO jointly of a grant of R1.35M from the Local Economic Development (LED) Fund. During the period under review, these funds were utilised for the development of plans for a Visitor Centre at SAAO Sutherland and an Activity Centre in the town, and for a variety of other projects and activities related to the joint activities of SAAO and the town.

In the spirit of the Cooperation Agreement, SAAO makes use of local suppliers and local labour, where practical. Sutherland residents have been employed in various aspects of the construction of SALT, and in various *ad hoc* projects at SAAO Sutherland. To facilitate the process of locating suitable persons for particular tasks, a register of unemployed persons and their skills has been compiled by the Municipality. In anticipation of the types of skills that will be required for the construction of the Visitor Centre and Activity Centre, the Sutherland Council has arranged training courses in conjunction with the Department of Labour.

The steady increase of visitors to SAAO Sutherland, and the associated impact on staff, necessitated a change in the way SAAO tours are organised. Advantage was taken of this opportunity to involve the newly-established tourism office in Sutherland for booking tours to SAAO. From November 2001, all enquiries and tour bookings have been channelled through the tourism office.

A project to hand-make solar eclipse viewers by the disabled and unemployed community in Sutherland using LED funding as seed money was started by C Rijdsdijk, who, using a special polymer imported from the UK, designed a unique viewer that is easy to use, robust and safe. This design was so successful that it was eventually used by all the major newspaper groups in South Africa. Viewers were included in newspapers a few days before the eclipse. In the months leading up to the eclipse, the Sutherland community made over 220 000 viewers which were sold at very competitive prices. With proper marketing, the Sutherland Solar Eclipse Viewer has the potential to become a steady source of labour and income for Sutherland and it is very



The sale of the first batch of solar eclipse viewers produced by members of the disabled community in Sutherland (photograph SAAO)

competitively priced by international standards. During the period under review, SAAO also played a major role in promoting science education in Sutherland schools. C Rijdsdijk presented a number of workshops for learners at local schools; visits to SAAO were arranged, and SAAO played an active role in discussions concerning the future role of the schools in Sutherland. SAAO Sutherland technician, J Stoffels, started teaching supplementary mathematics classes at the primary school. This began as a privately-organised activity, but it was so well received that a more formal arrangement has been made to continue providing these classes for a fixed period.

G10 LIGHT POLLUTION

SAAO continues to enjoy an excellent working relationship with the community of Sutherland regarding the control of light pollution in the town. P Martinez continued to represent SAAO in matters of light pollution. The town has gone out of its way to minimize light pollution and is in fact as good as invisible from the SAAO site.

G10(a) Weather Station at SAAO Cape Town

Meteorological observations at SAAO Cape Town began in November 1841, and have continued uninterrupted ever since, making it the oldest weather station in South Africa which is still in operation today. In fact, meteorological observations dating as far back as 1818 were processed by staff at SAAO. It can thus be said that SAAO served as the first headquarters for meteorological services in South Africa.

G11 SOUTH AFRICAN INSTITUTE OF PHYSICS (SAIP)

Astronomy will only flourish in a society which values science and a scientific approach to problem solving. More directly, the future of astronomy in South Africa is dependent on the health of physics as a discipline, and the quality of physics education at secondary and tertiary levels. The SAAO's long-term involvement in, and support of, the South African Institute of Physics (SAIP) is an acknowledgement of this situation.

The strategic planning sessions for astronomy highlighted the need for closer collaboration between the various astronomy groups and between them and the broader physics community. In particular, astronomers felt that their annual review should be linked to the SAIP meeting in future years. This annual conference of the SAIP presents an almost ideal opportunity to get the relevant people together.

In 2001, the SAIP conference was held at the University of Natal in Durban. R Stobie gave a plenary lecture entitled "SALT and what it can do for South African Science". This particular presentation was also open to the public and drew a great deal of interest. P Martinez gave a non-specialist lecture on the proposed "African Institute of Space Science" which was also well received. Various other SAAO and SALT staff made presentations during the astrophysics and education sessions. There was a very clear increase in the level of interest in astronomy over previous years, particularly from students, and the enthusiastic atmosphere was very encouraging.

C Rijdsdijk was elected to chair the education specialist group and P Whitelock was elected as President of SAIP. These results are an indication that the physics community itself acknowledges a leadership role for astrophysics.

G12 WORKING GROUP ON SPACE SCIENCES IN AFRICA (WGSSA)

The Working Group on Space Sciences in Africa promotes the development of the space sciences throughout the region by initiating and coordinating various capacity building programmes. At present, the Working Group has individual members in 25 African countries. Regional coordinators are responsible for promoting and coordinating the activities of the Working Group within their

regions, viz: Southern Africa, Central Africa, East Africa, West Africa, North Africa.

During the period under review P Martinez (SAAO) continued to serve as Coordinator of this Working Group. The fifth and sixth issues of the Working Group's newsletter, *African Skies/Cieux Africains*, were produced in January and December 2001, respectively, with sponsorship for production costs from the SAAO. Distribution of the newsletter rose from 1 000 copies to 1 200 copies. The newsletter was distributed by the United Nations Office for Outer Space Affairs. The Working Group maintains a website (<http://www.saa.ac.za/~wgssa>) which has links to various educational and scientific institutions in Africa and also contains past issues of *African Skies/Cieux Africains*. One of the objectives of the Working Group is to promote the use of SAAO and SALT as African facilities.



Visiting UNESCO Fellows: L Kebede (Addis Ababa), P Kalebwe (Zambia) and S Anguma (Mbarara) at SAAO Sutherland (photograph SAAO)

The principal project of the Working Group during the period under review was a pilot project to establish an *African Network for Education and Research in Astronomy* (ANERA). Funding for this was obtained from the UNESCO African Pilot Academic Exchange Programme. The pilot project commenced in mid-February 2001, with the arrival of S Anguma (Mbarara) and P Kalebwe (Zambia). They were joined by L Kebede (Addis Ababa) in May. The three visiting Fellows participated in several of SAAO's research programmes on variable stars. They received training in the use of astronomical instrumentation and in data analysis and reduction techniques. They also collaborated in the process of procuring a wide variety of teaching resources to take back to their home institutions.

Since most of the skills, resources and tools acquired by the Fellows rely on having access to a computer, each Fellow returned to his home institution with a computer populated with astronomy research and education software. Since returning to their home institutions, the Fellows have started presenting introductory astronomy lectures and/or strengthening astronomy outreach activities. With guidance from C Sterken (VUB) and P Martinez (SAAO), L Kebede (Addis Ababa) commenced a programme of site testing to identify possible locations for a small telescope in Ethiopia.

G13 AFRICAN INSTITUTE OF SPACE SCIENCE (AISS)

The idea of an African Institute of Space Science emerged out of discussions held jointly by a variety of stakeholders in the astrophysics and space science arena in January 2001, under the aegis of the National Research Foundation (NRF). These discussions highlighted the fact that there are a number of programmes and facilities, in existence or under construction, but no overarching co-ordination of all these activities. With improved coordination, the space science community could function more effectively and make a greater contribution to South Africa, and the region. The proposed Institute would thus serve as a focal point for developments in the space sciences in South Africa and as a point of contact with similar organisations around the world. The scope of the Institute could encompass space science activities in fields such as astronomy and astrophysics, space

physics, space geodesy, satellite engineering and research aspects of satellite applications. The AISS concept was embraced by the Board of the NRF, and the Board authorised further exploration of the concept in June 2001.

In June, the concept of an African Institute of Space Science was presented at the 10th United Nations/European Space Agency Workshop on Basic Space Science in Mauritius. The title of this Workshop was ‘Exploring the Universe: Sky Surveys, Space Exploration, and Space Technologies.’ The AISS concept was well received, and was debated in the closing session on Observations and Recommendations. The participants agreed that an African Institute of Space Science “would be a major step towards extending the participation of the developing countries in Africa in basic space science, and would possibly accelerate the spin-off benefits into society.” They further recommended that “African governments intent on fostering space science programmes should give due consideration to AISS, as appropriate to their needs, and that serious consideration should be given to the possible benefits of affiliating national programmes to AISS.” These observations and recommendations were published in UN General Assembly document A/AC.105/766. A more detailed description of the AISS concept appeared in Volume 13 of the *Seminars of the United Nations Programme on Space Applications*. In August 2001, the AISS concept was presented at a United Nations meeting titled “Making Space Applications Operational: Challenges and Opportunities for Sustainable Development,” where it, too, was well received.