SPEECH BY DR BERNIE FANAROFF TO THE WITS SCIENCE GRADUATION ON 27 MARCH 2013

Chancellor and Deputy Justice of the Constitutional Court, Justice Moseneke;

The Vice-Chancellor, Professor Loyiso Nongxa;

Deans of Faculties;

Convocation;

Members of the Procession;

Graduands and proud parents and partners;

I completed my BSc degree in physics at Wits in 1967 and then did an Honours degree here. I returned to Wits in 1974 and taught in the Physics Department until the end of 1976. The world was different then, and so was Wits. But some things have not changed and should not change and I want to talk about them.

First, however, I want to congratulate all of those who are graduating today. Your degrees are the result of very hard work and sustained effort over many years. Moving from schools to university is not easy – the demands on you are quite different and those of you who have succeeded can look back with real pride on the difficulties you have overcome. Moving from a first degree to post graduate study is another big leap which carries further challenges, and to those of you who are graduating today with higher degrees, my sincere congratulations and admiration for your perseverance, toughness and dedication.

I want also to congratulate the parents and relatives of the graduates who are here today. Your support has been invaluable in helping these wonderful young people to succeed.

I first came to Wits in 1965. That is 48 years ago. Democracy came to South Africa in 1994. That is 19 years ago. Next year we will celebrate the 20th anniversary of the first democratic election. It is very easy to forget what things were like then and how far we have come. Who remembers the influx control laws, which made people temporary visitors without security in their own country? Who remembers the Immorality Act? Who remembers detention without trial? Who remembers the Bantustans? These things seem very long ago and far away, but they aren’t really. We have come a long way in less than 20 years. We have a much longer way still to go, but we must remember to celebrate what we have achieved.
I said there are some things which have not changed. The first one is that it takes hard work to get a degree. In today’s fast-moving world, we expect instant gratification. With some exceptions, however, succeeding in the real world requires hard work, focus and dedication. There are some free lunches, but they are few and far between and most of us will never get the chance to eat them. I know far less now than I did when I was 25 or 35, but I do understand much better the little that I know. So there is some benefit in experience. Some young people I have worked with have not wanted to hear that. They expected to move into senior engineering or administrative posts very quickly, because they were bright and had a university degree. In most cases, what you learn on the job is as important as what you learned at university. You will give yourselves a much more solid grounding in life and in your career if you accept that success takes hard work and some patience.

The second thing which has not changed is that it is young people like you who are essential to the success of our country. A degree in science gives you more than a knowledge of science. It also gives you the skill and confidence to solve problems, not only problems in your own field, but in the wider world. It gives you the ability to learn quickly and to understand how systems work. It gives you the skill and the confidence to be innovative, not only in science, but in whatever you do. These are qualities which are in short supply in South Africa, as they are in many other countries.

When I was a student and again when I came back to South Africa, it was clear that everyone had a duty to oppose apartheid and the oppression of the majority of South Africa’s people. So it was a duty to participate in the struggle. I chose to help to organize and build the unions which later became a key part of COSATU. It was not easy and most of the time it was not fun either. The problems we face now are not easy. They are different, but not easy. They are challenges of poverty, inequality and exclusion. They are challenges of inefficient and ineffective administration and of delivery. The overriding challenge is how to transform our country into a wealthy country in which everyone benefits. We are often content to complain and criticize, while not feeling that we have in any way a responsibility to contribute. Young people with an education, especially a good education from a leading university like Wits, have a duty to help to build our country. I am convinced that education is the key to our success and the foundation for overcoming our challenges.

One of our most urgent problems is youth unemployment. It is not unique to South Africa. It is increasingly a problem all around the world, in both the developed and the developing world. One of the reasons is that the nature of employment is changing. Whether we like it or not, educated and skilled people are more likely to get work in the modern economy. We are deluding ourselves if we think that everyone can start a small business, especially without education and skills. Countries can
become wealthy because they have abundant oil or gas or gold or iron ore, but even those countries need an educated and skilled population for sustainable growth.

I think that the most important challenge still facing us after 19 years of democracy is to establish a successful basic education system. We tried to do too many things and to make too many changes too quickly. We added to the problems of the schools by abolishing teacher training colleges, nursing colleges and technikons and by weakening the artisan training system. The result is that we have too few highly skilled technicians and artisans, and too few highly skilled and capable teachers, nurses and police. We have far too few engineers and scientists and too few doctors.

It always amazes me what the engineers and scientists I work with on the Square Kilometer Array Project can do, because they have skill, expertise and commitment. You can make anything happen if you have those qualities. It is so much easier to do something if you know how to do it and have done it before. Whether it is the delivery of health, education, water, roads power or whatever, people who are skilled and competent at their jobs can make things happen efficiently. Whether you stay in science or go into business or the public service, you now have a solid foundation on which you can build competence in almost any field. You have a unique opportunity to contribute to the delivery of a wealthy, fair and equitable South Africa.

Our universities work remarkably well, despite the shortage of funding and the tremendous strains they are experiencing. Top international scientists who attend our annual conference for the bursary holders of the Square Kilometre Array project always say how impressed they are with the quality of our young people and the quality of their work, which they say is as good as anything they see at the world’s leading universities and research institutions. We must protect this. We must pump more resources into non-university tertiary education and training, to rectify our past mistakes. That is essential and urgent. But we must not sacrifice the universities along the way. That will be a mistake which is impossible to rectify.

I have been very lucky to work with some of the best and most committed young people in our country, in the unions, in the RDP Office, in the Department of Safety and Security and now in the Square Kilometre Array Project. Some of you will know that South Africa, with eight African partner countries, was recommended as the site for the world’s biggest science instrument, the Square Kilometre Array Radio Telescope. This telescope will be as prestigious as the Large Hadron Collider at CERN in France. Like CERN, the SKA is a global project, which currently involves ten countries and will soon have fifteen member countries. The science it will produce will be revolutionary. And it will mostly be in Africa. The science and the technology of the SKA are both extremely challenging and
exciting. It will require exascale computing – a thousand times faster than the fastest computers currently in existence. It will generate up to a hundred times as much data as flows through the worldwide web. It requires extremely sensitive radio receivers, working at the temperature of liquid helium, and antennas which work over extremely wide bandwidths. It requires data processing boards which use very little power and generate very little heat, while working extremely fast.

It has been a pleasure working with the SKA South Africa team. Most astronomers around the world didn’t believe that we could offer a credible bid for the SKA from Africa. We decided to build a scaled down version of the SKA, which we called the MeerKAT, in the Karoo, to show them that we can build the world’s most sophisticated science instruments in Africa and we can operate them and do outstanding science with them. Until the SKA is built, the MeerKAT will be the most sensitive and largest radio telescope in the world operating at cm-wavelengths. Most of the SKA South Africa team started with no knowledge of astronomy. We expected to get the answers from our colleagues in other countries, but quickly found that we had to answer the questions ourselves because many answers didn’t yet exist. So our team answered those questions and designed the prototype for the MeerKAT, the seven dish array which we call KAT 7. The first of the 64 MeerKAT dishes will be erected on our site in the Karoo at the end of this year and all 64 will be up and running by the end of 2016. Our team delivers, and it will play a central role in delivering the next 190 dishes of the SKA by 2020 and then the next 2500 dishes by 2025 and it will play a central role in delivering the whole SKA. The team is excited by the challenges and by their successes and they are totally committed.

Some of the students who did their MSc degrees on SKA SA bursaries went overseas to do their PhDs, but most of them have come back or are planning to come back to do their post-doctoral studies in South Africa, because the exciting projects in astronomy are here.

The money which the government has invested in astronomy has given us huge prestige, by hosting the world’s largest science instrument. It has attracted many young South Africans and some of the brightest young scientists and engineers from African and the rest of the world to study and work in South Africa. It has enabled us to strengthen research and teaching at many of our universities. It has enabled us to attract companies like IBM, CISCO and Intel to collaborate with the SKA SA team and with our universities on real, fundamental research. It is allowing us to develop a cadre of young scientists and engineers who have world-class expertise and skills in the technologies which will dominate the future economy. They will be well placed to help South Africa play a leading role in the completely new industries which will be critically important in the global economy, like the Big Data industry. The SKA has already and will continue to generate jobs in construction, operation and maintenance, but in my view, its most important contributions will be in attracting young people
into science and technology and keeping them there and in raising the profile and the excitement of science and technology in our country and in our continent.

The DST is committed to increasing the investment in science and is making progress in doing so. Our government has recognised that science and technology are key issues for development. This is also now being recognised in many other African countries, such as the eight we are working with to host the SKA telescope. It is a message which has gone down well in Europe, where the European Parliament last year passed a resolution to support radio astronomy in Africa as a catalyst for development. If you decide to take up a career in science, the prospects will I believe continue to improve. In astronomy and the related technology development, we can say that there will be significant opportunities, but there will also be opportunities in a number of other fields of science. We know from work in many fields that South African scientists are as good as or better than colleagues in other countries. We don’t have to be a backwater for science or for the development of cutting-edge technology. The SKA has shown that we can compete on equal terms with anyone, anywhere. We must build on that.

I want to again wish you all the very best for the future. You are the future of our country, be it in science, in government, in administration, in teaching, in business or wherever. You have so much to contribute.