

Botswana IDW Opening speech
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Mr. President,
Excellencies, Ladies and Gentlemen

It is an honor to be here in this important gathering addressing the frontiers of research in a digital age, in both a global and African setting. Our world is changing as never before, and that rapid change, largely driven by an unprecedented revolution in the Information and Communication Technologies (ICT), poses both challenges and opportunities for African researchers.

Today there are more mobile phones than there are people on the planet, and the ubiquitous internet allows us to connect with each other at the speed of light. The marriage of the mobile smart phone and the internet has resulted in the use of hand-held devices becoming the platform and instrument of choice for a new generation of both entrepreneurs and consumers, who have at their fingertips almost limitless access to information. In addition, in our hyper-connected world, a new social connectivity has emerged in our societies as has the unprecedented amount of big data sets that are not only kept and effectively maintained for commercial uses, but that can provide new insights for science in the digital age. Right here in Southern Africa is a major example of the new Big Data/Big Science of the future: The Square Kilometer Array (SKA) the large multi-radio telescope project of RSA and Australia that will benefit the whole world.

We can of course ask whether this enormous amount of new information will really benefit humanity, echoing the questions asked by T.S. Eliot a century ago:

Where is the Life we have lost in living?

Where is the wisdom we have lost in knowledge?

Where is the knowledge we have lost in information?

But science has brought us much better conditions. People live longer, healthier and freer lives than ever before. Fewer people suffer the pangs of hunger or are locked into extreme poverty, although violence and the scourge of war still persist in far too many places. But the world has rallied around the Sustainable Development Goals (SDGs), committing ourselves to abolish poverty and protect our planet. And today science is moving in leaps and bounds as it explores the unknown ... But we must make sure that it is inclusive of all, serves the many and does not become the private domain of the few. For as

Pasteur said: “Science knows no country, because knowledge belongs to humanity, and is the torch which illuminates the world.” We each add to the collective enterprise of Science, as we create our better tomorrows ...

As Longfellow said:

Build to-day, then, strong and sure,
With a firm and ample base;
And ascending and secure
Shall to-morrow find its place.

– Henry Wadsworth Longfellow “The Builders”

Today – and even more tomorrow – Artificial Intelligence, Virtual Reality and Augmented Reality are all becoming commonplace and are integrating the classroom and the workplace. It is a revolution that is likely to have a much bigger impact on our lives, causing a disruption that is 3000 times greater than the industrial revolution¹, which was much more localized and evolved much more slowly.

But this technological revolution is based on science, and the pursuit of science is a journey of exploration and it is a global enterprise. In the global digital age, the age of Big Data and of Artificial Intelligence, Science is adopting new standards of openness and transparency. It is the new era of Open Science....

At a time when Commercial enterprises are dominating the new economic landscape, it is essential that governments and public entities regulate the digital environment to encourage Open Science. Why?

Of the ten largest companies in the world, seven are technology companies. Five are American, and of these, Apple has become the first company in history to be valued (for a while) at over a trillion dollars, and it is about to be joined in these stratospheric levels by Amazon with Alphabet (Google), Microsoft and Facebook not far behind. Chinese tech firms are also present, with Alibaba and Tencent. These giants have limitless resources, proprietary methodologies and also gather enormous information on billions of people. These and the other enormous and diverse data fluxes that are becoming available to researchers are a new hallmark of our information age.

¹ “Today our world is undergoing an even more dramatic transition due to the confluence of four fundamental disruptive forces—any of which would rank among the greatest changes the global economy has ever seen. Compared with the Industrial Revolution, we estimate that this change is happening ten times faster and at 300 times the scale, or roughly 3,000 times the impact”. Book excerpts, at <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/the-four-global-forces-breaking-all-the-trends> (accessed 31 10 2018); Referring to the book: Richard Dobbs, James Manyika and Jonathan Woetzel; *No ordinary Disruption*, Public Affairs, USA, 2015.

The deluge of data being generated by people putting more than two Exabytes of data on the internet every day, is being harvested and used or sold by commercial entities, raising questions about privacy. And when handling this data, from curating to analysis, the big commercial interests have their own proprietary analytical methods. And they can hire many specialized university departments and also buy out promising new start-ups.

Today, publication in scientific journals and access to these journals can be difficult and expensive for researchers in poor and small countries....But the ubiquitous internet can also overcome these obstacles. It can help researchers in Africa as much as it helps those in Europe, or America.

Access to the data and the open development of methods and the sharing of research results as quickly as possible, is what Open Science is all about... for this generation of scientists and the next who are now pupils... Thus Open Science is about: Open Data, Open Sources, Open Methodology, Open Peer Review, Open Access and Open Educational Resources.

But recall that data when organized becomes information, which when explained becomes knowledge. But our societies need more than knowledge, they need wisdom. Thus the Knowledge produced by the Natural Sciences, requires the insights of the Social Sciences and the wisdom of the Humanities. Urbanization, globalization and climate change are impacting both our ecosystems and our economies. Challenges abound from poverty to gender issues, from public health to food security. All these challenges need regional and global engagement. Finding the right solutions requires multi-disciplinarity with global participation and engagement from across the whole spectrum of research.

Open Science is more than just putting all the data on the internet. It also involves procedures to facilitate access, analysis and collaboration in the use of data and to promote creativity in addressing scientific and societal challenges. These processes should be inclusive; benefitting all, harnessing all energies, leaving no parts of the world and no disciplines behind. Yes, the disciplines of tomorrow, and more importantly, the research methods of tomorrow, will be different than they were in the past. In the past, we had biology and chemistry, and now we also have biochemistry. In the research methods of biology, the genetics revolution has made DNA and RNA household words, and also transformed the fields of zoology and biology creating many new fields from genomics to proteomics. Looking back at the past quarter century, we can measure the extent of the scientific revolutions that have touched almost every discipline.... Looking forward to the next quarter century, the possibilities

seems limitless. Science will build on past achievements and create new ones to explore ever newer frontiers...

Indeed, as Eliot said:

“For last year's words belong to last year's language
And next year's words await another voice.”

— T.S. Eliot, Four Quartets

Excellencies, Ladies and gentlemen,

Against that background, the major themes of this conference will cover:

- the frontiers of research in a digital age;
- applications, progress and challenges of data intensive research; and
- data infrastructure and enabling practices for international and collaborative research.

The conference brings together data scientists, researchers from all disciplines, industry leaders, entrepreneurs, policy makers and data stewards. All areas of research are represented, including the social sciences, humanities and business and management sciences, as well as the applications of data in industry and development.

With your support, the conference will have a legacy that will see advances in the implementation of Open Science, and that will encourage the explorations of global scientific collaborations to exalt our common humanity. That common humanity that we had lost sight of in the decades of savage competition, and of worshipping at the altar of the market mechanism, forgetting that the market is a good servant but a bad master. And the ruthless allocative efficiency of the market must be tempered by a nurturing and caring society. That is how we will truly celebrate our common humanity. For that is the objective which we all seek. It is the objective that is at the heart of the SDGs... It is the objective that scientific exploration pursues... and ...

“We shall not cease from exploration
And the end of all our exploring
Will be to arrive where we started
And know the place for the first time.”

— T.S. Eliot, Four Quartets

Thank you.