

**Science for Development Workshop: 30-31 January 2020, South African Astronomical Observatory, Cape Town**

*Abstracts as at 28th January 2020, in alphabetical order of presenter names*

<b>Presenter Name</b>	<b>Presentation Title</b>	<b>Abstract</b>
Alberto J Tsamba	The role of Industry in Engineering Training Quality	Development is an engineering driven phenomena. However, the training of engineering professionals is costly and not commonly among the preferences of the youth. Therefore, improving the training efficiency and the quality of graduate technologists and engineers is the key to allow optimisation of the few "engineering lovers". A strong partnership within industry and engineering training schools is the most simple option to achieve this goal and overcome the shortage in candidates for training.
Anton Binneman	SKA South Africa: Moving from Stakeholder Management to Stakeholder Engagement a case study	This presentation reflects on how stakeholder management and communication evolved since the inception of the South African part of the project to shed light on the complexities and challenges of science communication and stakeholder management and engagement. The discussions on the stakeholder communication that evolved during the four phases identified, demonstrates how the shift from stakeholder management to stakeholder engagement occurred and what the implications of these shifts were.
Areg Mickaelian	Astronomy as an example of Inter-and Multi-Disciplinary Sciences	I will review the current development of Astronomy and its role as a science providing data for all other natural sciences: physics, chemistry, biology, geology, etc., as well as informatics. A number of interdisciplinary sciences have appeared: astrophysics, astrochemistry, astrobiology, astrogeology, astrostatistics, astroinformatics, etc. Many new discoveries have been achieved based on these data due to interdisciplinary approach.

<p>Claire Davis-Reddy</p>	<p>Integrated data and decision-support tools: the development of South Africa's Open Data Platform</p>	<p>The South African Earth Observation Network has been active in the development of data management systems since 2008. This effort has resulted in a collection of services, tools, and components that is referred to as the Open Data Platform. The ODP is tasked with the publication, discovery, dissemination, and preservation of Earth Observation and Environmental Data. The purpose is to promote open science and satisfy funder requirements through the publication of data and scientific evidence.</p>
<p>Cláudio Paulo</p>	<p>Helping the Mozambican Government to see Science as a Tool for Development</p>	<p>Mozambique is a country showing very interesting potential to grow from the next decade. Many natural resources are being discovered and the Country is also part of the future Square Kilometre Array Project. Thus, It is very important to start actions to show the Government the contribution that science can give for the Development of the Country. Basically this a very brief talk showing some effort to help Mozambican Government to see Science as a Tool for Development.</p>
<p>Dafon Aimé SEGLA</p>	<p>Mobile apps for the illiterate Knowledge production and self-learning among the Yoruba people in Benin Republic</p>	<p>I criticize the exclusion of illiterate populations from access to ICT in Benin. Yoruba who are non-literate in foreign languages struggle, being unable to even know their own mobile phone numbers. However, even in these conditions of handicap, local people are innovative by creating new procedural knowledge such as using signs, images, specific symbols, and voice messages.</p>

Dieter von Fintel	The randomista revolution in the social sciences: measuring cause and effect amid complexity	Social scientists don't work in controlled laboratories; instead, they study processes that exist in complex contexts, where humans, politics, the external environment and many other unknown factors interact to conceal true causal relationships. Blind comparisons of treatment and control groups can therefore give a flawed view of the impact of interventions. Two broad solutions to this conundrum are popularly followed: firstly, economists look for experiments or shocks in data ex-post and apply clever statistical techniques that approach causality – we will briefly consider a few visually intuitive cases; secondly, the recent group of Nobel laureates (Banerjee, Duflo and Kremer) have pioneered the implementation of randomised control trials – borrowed from the medical sciences - for understanding economic and social processes. Both approaches have their strengths and weaknesses, and finding impact remains a continual challenge.
Effiom Antia	Coastal hazard mapping imperatives to socio-economic development of rural coastal communities	Coastal regions are vulnerable to a wide range of natural and human-induced hazards that adversely impact on their overall potentials as ecologic systems as well as recreational and tourism appeals with attendant set-backs in socio-economic developments of rural coastal communities. The prospect of coastal hazards mapping, as both a predictive and intervention tool for coastal region management, is the focus of this presentation, drawing from Nigerian case studies.
Evans Nyakeri	Remote Sensing for Forecasting Emergence of Edible Insects	Edible insects are now considered a novel but underutilized resource for tackling insecurity of food, protein and micro nutrients. The main source of edible insects is the wild due to limited technologies for mass production. Forecasting of their emergence is dependent on traditional Knowledge and is unpredictable in terms of quantity, timing and location due to climate change. Is it possible to use remote sensing technology to simplify the tedious job by accurately predicting emergence?

Felix Emeka Anyiam	Health and Happiness: The role of Data Science implementation in enhancing the well being of citizens through effective Data Policy-making	Data is the lifeblood of decision-making and the raw material for accountability. There has never been a more exciting time to be involved in the utilization of data, as our world is transformed by data. We have in our disposal large unexplored data with such a potential to transform our living status, and yet, in some economies, policy-making that affects the health and well being of the citizens is still been driven by personal sentiment, opinion or believe with little empirical inputs.
Jamal Mimouni	A Holy Alliance: Balancing the Academic Act with Outreach Action	It's about professional astronomy. It's also about engagement with the public. We discuss, taking the cases of Algeria and Morocco as examples, how the synergy between the two kinds of activities, and in particular if carried out by people engaging themselves in both of those domains of activities, can bring a bright future for Astronomy in developing countries, and more broadly speaking, works as a ferment for scientific culture awakening.
Joshua Kalognia	Promoting Radio Astronomy in Ghana through School Visits and Astronomy Clubs	“Promoting Radio Astronomy in Ghana through School Visits and Astronomy Clubs” (PRAGSAC) introduced students to practical astronomy topics to build their interest in science for an informed academic and career choices. By working through school visits and the formation of school clubs, students were exposed to basic applied Astronomy for them to appreciate the importance and benefits of the Ghana Radio Astronomy Observatory (GRAO) at Kuntunse.
Juan Steyn	The South African Centre for Digital Language Resources	SADiLaR is a national centre supported by the Department of Science and Innovation (DSI) and part of the South African Research Infrastructure Roadmap. SADiLaR has an enabling function, with a focus on all official languages of South Africa, supporting research and development in the domains of language technologies and language-related studies in the humanities and social sciences. This talk will share how interdisciplinary work is promoted through a focussed capacity development programme.

Julienne Nguefack	Addressing Sustainable Development Goals through Biowalk with Bioproducts	The use of inputs from plant origin increased the rice and tomato yield, the content in fruits micronutrients, minerals, vegetable raw fibers, antioxidant capacity, storage shelve live. The treatments improved the soil physicochemical properties, nitrogen use efficiency. Copper Content in the organic amended soil was reduced. The organic amendment improved the beneficial soil-borne microflora load. These results could address 13 sustainable development goals.
Kifle Woldearegay Woldemariam	Need for multi-disciplinary approach to address landslide hazards in Africa	Landslides are among the major hazards in many countries in Sub-Saharan Africa. The factors causing landslides are: quasi-static factors (soil/rock) and changing variables which are associated with human-landscape interactions (deforestation, gully erosion, settlement, etc). Landslide related researches in Africa have been disciplinary though the processes affecting landslides are complex interactions of different factors. This calls for a multi-disciplinary approach of addressing landslides.
Kylah Forbes-Biggs	Mind the Gap ! Community Engagement for Bridging Divides in Research	Community Engagement is proposed as an approach to bridge the science-society-policy divide. This approach enlists community, researchers, civil society and public sector as partners, while drawing on their respective 'expertise' to identify and address complex problems. It promotes the notion of 'reciprocal knowledge sharing' and the 'co-production' of knowledge as creating viable solutions. It creates spaces for marginalised populations to give insight via expressing their lived experiences.
Leon Orotta	Science-for-development projects "on the ground" using Remote Sensing Technology	Remote sensing is used to acquire statistics on crops in developing countries and to locate petroleum and mineral deposits. It has increasing potential for forest monitoring and subsurface water location. Problems related to Third World use of the technology include sensitivity about the dissemination of data with high spatial resolution,

Lucia Marchetti	Soapbox Science project and opportunities	Soapbox Science is a public outreach platform for promoting women scientists. Main goals are bringing science to the streets and, at the same time, fight the “who is a scientist?” stereotypes. In 2019 we organised the first Soapbox Science event in South Africa, joining a network of 42 events worldwide (5 in African countries). The Soapbox Science alumni network of soapbox science ex-speakers (>500 worldwide) could be a resource for a multi-disciplinary mentoring program worth exploring further.
Margherita Molaro	Lessons learnt: how to make South African STEM more inclusive	The vast majority of South Africans has no access to careers in STEM. Apart from being a grave social injustice, this means that industry statistically misses the excellence in the wider sample of talent. Addressing this issue requires an in-depth understanding of the factors that prevent underserved youths from accessing these careers. I will present the lessons learnt by Molo Mhlaba, an all-girls STEM school in the underserved community of Khayelitsha, which has taken on this challenge.
Michelle Willebrands	Pale Blue Dot - A Universe Awareness Project (PBD-UNAWE)	The perspective of Earth from space excites children about science, but also raises environmental awareness and stimulates open-mindedness to other cultures. PBD-UNAWE will use astronomy education to advance the UN SDGs 4 (Education),13 (Climate), and 16 (Peace). The project will co-create hands-on materials with local teachers to tailor them to local culture. It will also research to what extent this programme can have a lasting effect on children’s sense of global citizenship.
Mitulo Silengo	Building resilience in local development of communities in the context of climate change	The vulnerability of communities in local development is becoming more apparent in the context of climate change. The recent drought experienced in some countries in southern Africa attests to this. In order to rise to this, challenge, innovative ideas are required to build the resilience of communities.

Nadeem Oozeer	Innovative And Transformative Education for Africa.	Education is a global industry that leads the way in innovation, product implementation and long term contribution to a country's economy. To enhance the contribution of education to innovation, training systems must undergo changes to become more innovative themselves by taking various factors into account such as resources, stakeholder involvement, culture, teaching and learning methodologies. We will present various activities that is helping to transform the next generation Africans.
Niyi Abiola Kushimo	The role of IT industry in science-for-development	The role of the IT industry in science-for-development cannot be over emphasized. The industry stands as an implementation ground for scientific discoveries and theories. As industries in Science aims for profits, its secondary purpose is to provide a pedestal for development to the society. This talk aims to present IT (Information Technology) as a field that establishes a global bridge between diverse disciplines, particularly science and how this fosters societal development
Nomasomi Gasa	Introductory Talk: Interdisciplinary collaborations in Africa	Interdisciplinary collaborations have grown as an approach to do research, expertise from different fields coming together to solve a problem through research teams. These collaborations lead to knowledge production and creating networks. One other important aspect is that they break silos between disciplines as it allows researchers to view the problem from a new perspective. Some funding agencies have set aside awards or grants specifically for interdisciplinary research. However, there has also been funding structure catering to African collaborations. The Leading Integrated Research for Agenda 2030 is a 5-year programme that is designed for African collaborations, specifically for early career researchers.

Olajide Olufemi AFOLABI	Need for a coordinated African small satellite development community.	Urgent need to create a satellite engineering community in Africa made up of experienced engineering personnel which abounds in our universities with expertise oriented to space components development. Available machinery across the continent as clusters of development centers with tasks for excellence in a component development i.e thruster, structures, adcs, power, etc test equipment and environment can be developed. AfDB to assist. Gains are job opportunities, disaster and hunger reduction.
Olumuyiwa Adebayo	Synergizing Science for Suicide Prevention –Artificial Intelligence and Medicine	Suicide continues to be a public health burden in many countries of Africa. Globally, according to WHO, over 800,000 people die of suicide yearly. Namibia was the first African nation to develop a national suicide prevention strategy. Nigeria which ranks 10th African country with a higher rate of suicide (WHO ), is without a plan to deal with the crisis. Part of our strategy should be a concerted professional intervention and collaboration among the Medical and Artificial Intelligence experts.
Onuche Ogu	Astronomy for Development: IDP Children’s Astronomy Outreach Project	This presentation is based on the Internally displaced children astronomy outreach project and its impact on the lives of the children. This project used astronomy as a tool to counsel, heal and inspire children that have been displaced due to violent conflicts in their villages and towns. The project involved conducting cognitive behavioural therapy by seasoned counselors and the results were analysed. A solar powered learning hub was installed in the children’s camp to inspire the children.
Philip Osano	Synergies and trade-offs in SDGs	The interlinkages and integrated nature of the Sustainable Development Goals (SDGs) are of crucial importance in ensuring that the purpose of the Agenda 2030 is realised. However governments and practitioners are challenged in ensuring an integrated approach to planning and implementation of measures to realise the SDG goals in an integrated and indivisible manner. This talk will highlight the frameworks and tools developed by SEI to support integrated planning with examples of their application



Ranpal Gill	Anticipating Rubin Observatory's Legacy Survey of Space and Time	The Large Synoptic Survey Telescope is currently under construction in Chile. The 10 year survey of the visible southern sky is due to start in late 2022, at the end of the survey there will be a final catalogue of 15 petabytes of data. The Education and Public Outreach platform being developed will be accessible by all and provide engaging online experiences enabling anyone to explore the Universe and participate in the discovery process.
Regina Folorunsho	Climate Change: Developing a climate risk framework for the West Africa coast	Recent perturbations in some climate and oceanographic parameters has become a source of concern to cities and other coastal communities along the coast of West Africa. Climate change adaptation is important. Accurate assessment of climate risk and conversion of risk assessment results into prevention and mitigation is very crucial but also a challenge.
Sie Kam	Highly qualified personnel for development in Burkina Faso through Astronomy	The astrophysical project in Burkina Faso is based on a need to set up a pole of excellence in physics, in order to bring a development by : 1st training of qualified personnel for teaching and working with physics as basic. 2nd, establishment of adequate infrastructures. Then create research and professionalizing trainings to finally bring job creation : bring development by forming multi-competences people. Will expose our strategy and to see how to refocus actions on development.
Sonal Asgotraa	Astronomy for Livelihood	Lack of electricity, education and access to sustainable monetary incomes are critical problems surrounding remote Himalayan communities. But they have a powerful resource which has never been used to bring about change and growth –Their Clear Night Skies. AstroStays, an outcome of the AHLC program, is a community centric Astro-Tourism model that directly engages trained local homestay owners to conduct night sky watching sessions for incoming travelers creating new streams of income generation.

Stanley Maphosa	"Bridging gaps between scientists and policy makers".	Science is in everything be it water, food, energy or climate change. Scientists (both natural and social) bring in the science which is mainly in the academic space of laboratories, conferences and publications. The policy maker may or may not be a scientist yet is guided by a number of issues to develop and implement policies. The gap between scientists and policy makers need to be bridged to ensure evidence based policies. Science academies play a key role as boundary organisations
Sunita Facknath	Making our farmers climate resilient - a Science-for-Development project from the island of Mauritius	Climate change is impacting negatively on food security and livelihoods in Africa. With a view to making small holder farms climate resilient, an EU-funded, farmer participatory project is ongoing that involves farmers working hand-in-hand with scientists to develop agricultural technologies for climate change adaptation and mitigation, while ensuring sustainable livelihoods, namely transformation to a Climate Smart Agriculture approach, that includes technological, policy and financial aspects.
Tanya Graham	Policy@Manchester	Policy@Manchester aims to impact lives globally, nationally and locally through influencing and challenging policymakers with robust research-informed evidence and ideas.
Thando Mtshizana	Climate Change on Sustainable Development	Humanity has the ability to make development sustainable – to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs. This revolves around three pillars namely, environment, society and economy. Climate change invariably changes and destabilizes this ideal under the auspices of carbon footprint particularly greenhouse gases. Accompanying is global warming, sea level rises and flooding risks that disregard population growth.

<p>Thimothy Thamae</p>	<p>A Need for University Innovation Ecosystems: The Case of the National University of Lesotho</p>	<p>Traditionally, universities tend to rely on the so-called Intellectual Property Offices (IPOs) for commercialization of science research. We show why this approach is deficient in universities of developing countries like Lesotho. We also demonstrate how the National University of Lesotho (NUL) created a more holistic way to deal with commercialization by creating from scratch a customized and self-sustaining innovation ecosystem which is already creating new industries.</p>
<p>Vukosi Marivate</p>	<p>Data Science for Education Policy Making</p>	<p>Application of big data analytics associated with its value extraction practices can support decision making. In education, analyzing schools data supports policy formulation to address three scenarios, namely, supporting learning, teaching and administration in schools. To improve performance in South African schools, this research presents an education data mining approach and machine learning techniques for identifying important features that can predict the performance.</p>