NATIONAL SCIENCE WEEK 2021:
IMPLEMENTATION PLAN

"Making it possible through science"

CONTENTS

ABBREVIATIONS

4IR	Fourth Industrial Revolution
5G	Fifth generation technology
AI	Artificial Intelligence
COVID-19	Coronavirus disease
DSI	Department of Science and Innovation
ICT	information and communications technologies
IKS	Indigenous Knowledge System
IYFV	International Year of Fruits and Vegetables
NSW	National Science Week
SAASTA	South African Agency for Science and Technology Advancement
SES	Science Engagement Strategy
STEM	science, technology, engineering and mathematics
STI	science, technology and innovation
UK	United Kingdom
UN	United Nations
WHO	World Health Organisation

1   INTRODUCTION

1.1   Policy and strategic perspective

The adoption of the 2019 White Paper on Science, Technology and Innovation (STI), which advocates the development of a science-aware and science-literate society is considered as an opportunity to consolidate and deepen the 20 years old science engagement programme led by the Department of Science and Innovation (DSI). These endeavours will be guided by the Science Engagement Strategy (SES, 2015) – hereinafter referred to as the Strategy. The Strategy responds to the White Paper by attempting to build a society that is knowledgeable about science, able to form independent opinions on science issues and scientifically literate. Such an attempt will be through implementing a variety of interventions that are well orchestrated to:

(a) popularise science, engineering, technology and innovation as attractive, relevant and accessible in order to enhance scientific literacy and awaken interest in relevant careers;

(b) develop a critical public that actively engages and participates in the national discourse of science and technology to the benefit of society;

(c) promote science communication that will enhance science engagement in South Africa; and

(d) profile South African science and science achievements domestically and internationally, demonstrating their contribution to national development and global science, thereby enhancing their public standing.

1.2   Implementing the Strategy

The consolidation and deepening of the science engagement programme under the Strategy involves the introduction of new interventions and expansion of existing ones. And in both instances, inclusive participation of the citizens and maximisation of access to accurate science content are prioritised. Existing interventions include the annual mass participation National Science Week (NSW) – which due to its evolution over the years, is now considered a flagship science engagement event of the DSI. Since its inception in 2000, the NSW has been conducted annually, except in 2020 due to the corona virus (COVID-19) pandemic disruptions. What led to the cancellation of the NSW 2020 is the fact that it has so far been conducted as an in-person event. In-person events have become practically impossible as they are not consistent with the non-pharmaceutical interventions against COVID-19. Perhaps

the challenges to conducting in-person activities brought about by the COVID-19 pandemic are blessing in disguise as the lack of technology use in conducting the NSW and across the science engagement programme in general, slowed down the its reach to the target publics.

The fact that South Africa entered the second wave of the COVID-19 in December 2020 and the third wave likely occur as early as March/April 2021, tells that in-person events may remain impossible to conduct in the near future. This whole situation calls upon a rethink in the approaches that have been relied upon over the years to produce citizens' interest in, awareness and enjoyment of science, as well as building their knowledge and confidence in science. Taking these and related developments into consideration, this document presents a plan for conducting the NSW 2021.

2 THE PLAN FOR CONDUCTING THE NSW 2021

Irrespective of the mode adopted in conducting the NSW under the current circumstances, any approach opted for needs to preserve the NSW mass participation form.

2.1 Theme

The NSW 2021 will be conducted under the theme *"**Making it possible through science**"*.

2.2 Objectives

The objectives of celebrating the NSW 2021 under the aforementioned theme are to:
  (a) illustrate the role of science in tackling problems and challenges encountered in creating and sustaining a prosperous society;
  (b) demystify the myths surrounding some of the innovations that are important to the advancement of society;
  (c) display that South Africa is a home of some discoveries and innovations that influence the world; and
  (d) raise science, technology, engineering and mathematics (STEM) career awareness.

Keeping up with the practice of recognising the United Nations (UN) international observances, the NSW 2021 will incorporate activities to celebrate the UN's International Year of Fruits and Vegetables (IYFV) 2021. Attention will be given to local discoveries and innovations in plant production or sciences.

2.3 Dates of the NSW 2021

It has become a tradition that the NSW takes place during the first week of August. Sustaining this practice, the NSW 2021 will take place from 1 - 7 August 2021. The focus week activities will be preceded by a media launch led by the Minister of Science and Innovation to mark the beginning of the event. Details about the launch will be handled separately as it has grown to be an event on its own.

2.4 Implementation Approach

The NSW 2021 will be conducted through information and communications technologies (ICT). Investigation conducted has revealed interesting association of South Africans with various ICTs, which if adequately exploited would exponentially expand the reach of the science engagement campaign. The daily programme will be packaged as presented in Figure 1. Institutions can apply for one or more implementation approaches as presented in Figure 2 and Table 1, respectively to contribute in the science week.

06:00 - 09:00 : **Morning live / drive**

10:30 - 11:30 : **Featured Documentary**

12:00 - 13:30 : **Webinars**

14:00 - 15:30 : **Virtual Exhibitions**

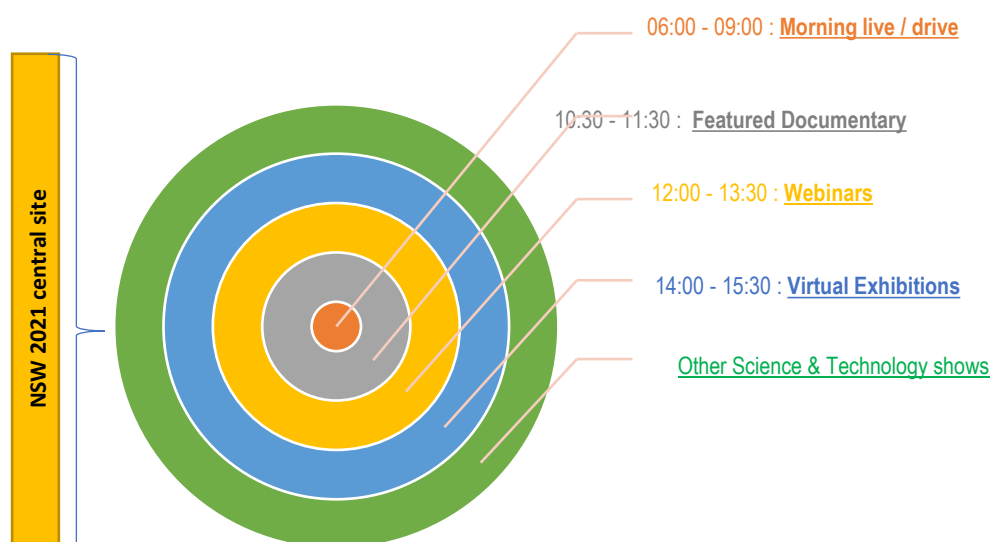Other Science & Technology shows

NSW 2021 central site

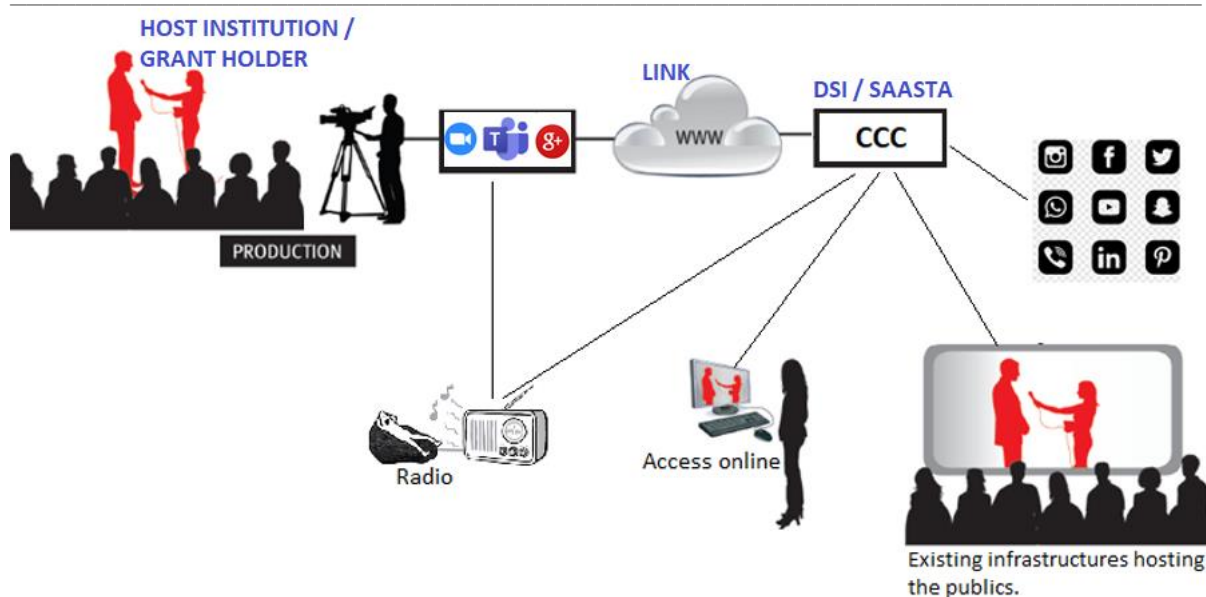Figure 1: 2021 NSW daily virtual programme at a glance.

Figure 2: Multimedia and streaming approach for NSW 2021.

Table 1: NSW 2021 at a glance (draft)

1 Aug *Programme Director: TBD*	2 – 6 Aug *Programme Director: TBD*	Platforms
09:00 – 10:00 NSW National Launch The Minister	07:00 – 09:00 Morning Drive shows: (radio stations)	**Live:** Radio
12:00 – 13:30 **Webinar 1**	10:00 – 11:30 **Documentary 2**	**Recorded:** You Tube / Facebook / website / etc.
10:00 – 11:30 **Documentary 1**	12:00 – 13:30 **Webinar 2**	**Live & Recorded:** Zoom / MS Teams / Google+ / etc.
14:00 – 16:00 **Featured virtual exhibit 1**	14:00 – 16:00 **Featured virtual exhibit 2 – 10**	**Live & Recorded:** Zoom / MS Teams / Google+ / etc.
Open virtual exhibition – interactive floor plan 24/7 accessible to the publics	Open virtual exhibition – interactive floor plan 24/7 accessible to the publics	**Recorded:**

Table 2: Description of NSW 2021 implementation approach

Implementation approach	Description	Proposed topics	Responsibility
Documentaries	The production and dissemination of documentaries is meant for entertainment and educational (edutainment) purpose as a tool for science communication, popularisation and public engagement with science towards scientifically literacy.	1. The history and evolution of vaccines. 2. Technologies are changing the future of work – *understanding 4IR & AI.* 3. Mobile broadband as a stepping stone to debunk 5G technology myths. 4. Science as a way of unravelling natural phenomena and predicting the future: *The South African COVID-19 pandemic case study.* 5. Can South Africa be considered influential in science, technology and innovation: Looking into some of the local inventions and discoveries, as well as the scientific areas in which South Africa has geographic or knowledge advantage. 6. A perspective on how scholars perceive attitudes to science in policymaking in South Africa. 7. Physics and my village.	Appointed Institutions: Use documentary scripts as a guiding tool. Create a link for the documentary accessible by different devices. One institution per topic
Webinars	Each of the above-mentioned webinars will be hosted by a subject matter experts (institutions) to guide through the topics and address any questions that may arise. Eligible partners or institutions with relevant facilities, expertise and equipment will apply for grants to host the webinars.	1. A study of COVID-19 data from African countries 2. How the blue skies research created billions of Rands worth of impact in South Africa. 3. Does South Africa have policy and regulatory that are credible in the determination of relevant vaccines? 4. A framework for human collaborative robots, operations in South African automotive industry 5. Dismantling Covid-19 5G myths. Debunking of the myths about the 5G technology. 6. The importance of uncertainty in many scientific predictions, and the relevance of this to environmental controversies. Due to the outbreak of COVID-19, the mental health of the people all around the world is severely disrupted. 7. A perspective on how scholars perceive attitudes to science in policymaking in South Africa	Appointed Institutions: Host webinars Manage the platform and provide the link for the publics to attend from different platforms. One institution per topic

Virtual Exhibition	Virtual / online exhibitions will take place on an interactive floor plan to showcase and demonstrate the application of science by the selected scientific institutions, particularly those that are funded by government. The online exhibitions will not be restricted by time; they are not forced to open and close but may be available 24 hours a day. However, there will be a line-up of pre-recorded exhibits which their institutions will be available at certain times for live engagement with the viewers, as outlined.	Exhibits will cover the following areas: 1. Robotic 2. Basic sciences 3. Energy 4. Indigenous Knowledge System (IKS) 5. Environmental 6. Health 7. Space science and technology 8. Astronomy 9. etc.	One institution per exhibit
Mainstream media	Radio is a medium with capability to reach more people of different classes due in all 11 official languages in South Africa. Radio shows/programmes such as the morning live/drive shows, educational shows and news attract more listeners due to their strategic timing and normally give a boost needed on daily basis.	*Radio show and programmes:* DSI/SAASTA will sponsor these shows and have the NSW 2021 content or topics covered with scientists/experts featured to explain and answer few questions just for 10 to 15 minutes daily. Presenter(s) of the show will read the NSW scripts after every news bulletin to encourage the listeners to join webinars and watch documentaries. Each show will be wrapped with a quiz to test the knowledge of the listeners with prizes such as educational vouchers, internet data, tablets, etc. Questions for each show will be sent to the radio stations by DSI/SAASTA. The exercise will be accompanied by numerous NSW adverts. *Live feeds:* updates reports randomly fed to different radio stations during the day. This will afford opportunity for scientists/experts from HEIs, science councils, DSI/SAASTA to be interviewed in all 11 official languages.	

3 IMPLEMENTATION PROCESS

3.1 Documentaries

The documentaries scripts in Annexure A will serve as a guiding tools to inform the development of content. Due to the nature of documentaries, they must present correct and credible information. Therefore, capable and trusted partners with good reputation in the society should be considered for this task. Apart from the topics that have been listed in this plan, potential partners can suggest other topics or bring their recent existing documentaries that are relevant to the NSW 2021 theme for consideration.

One topic of documentary could involve a number of other role players from the similar field/industry. DSI/SAASTA may assist to facilitate the involvement of relevant role players in different ways like opening their facilities and allowing their experts for filming and interviews, where necessary. Documentaries will be released through a simulcast by a number of digital platforms to maximise the reach to the diverse publics. The projected reach through the digital platforms and mainstream media.

3.2 Hosting of webinars

Proposed topics will be presented in the form of webinars by the appointed grant holders and be aired live through online and offline means. Dates and times for each topic which will be within the NSW focus week. However, there will be space for another webinars series of eight topics to be covered once per week in the build-up for a period of two months before the commencement of the 2021 Science Week. The eight topics will be selected from the ongoing webinar series that are planned by different institutions. Depending on the COVID-19 lockdown regulations during the NSW 2021, some webinars may follow a hybrid approach with the allowed/prescribed number of attendees on site and the masses catching it live through the channels mentioned in this document.
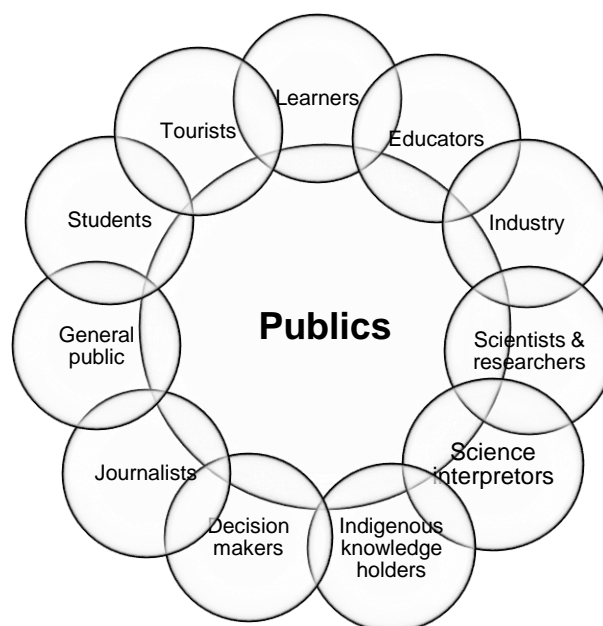
4 EXPECTED REACH

4.1 Target publics

Figure 3: Target publics

4.2 Enhancing the reach to target publics

The number of publics to be reached will be enhanced through a targeted approach by reaching out to them. Previous experience proved that media plays a crucial role in reaching more publics simply because it is able to reach people wherever they are at any time. Different publics will be reached and be able to participate through the channels of their choice as tabulated in Table 3.

Table 3: Platforms to reach target publics

Social media platform	No. of users (Million)	Majority users age-groups	*Target publics	Content	Expected participation
Facebook	84.3	13 to 44 (80 %)	L, E, Gp, T, IK, Si	Video, Photo, Link, Question, Event, and Text	Likes, react, share, comment, answer
Instagram	5.43	12 to 44 (86 %)	S, J,	Video, photo, Discussions	Likes, interaction / participation
LinkedIn	8.24	18 to 35 (81 %)	S, Sr, Si,	Event, Question, Link	Comments, like
Twitter	3.88	18 to 49	Dm, I, T, Si,	Video, Photo, Link, Question, Event, and Text	Likes, react, share, comment, answer
YouTube		13 to 50	All	Live videos,	Like, comments

*L: Learners, E: Educators, S: Students, Sr: Scientists & researchers, Si: Science interpreters, IK: Indigenous knowledge holders, Dm: Decision makers, J: Journalists, I: Industry, T: Tourists, Gp: General public.

Segmenting the publics through different categories per relevant media / channels with an understanding of the nature of information to be placed in their disposal will obviously capture their attention and subsequent meaning participation. Another element to be considered is to ensure that the content is not only user-friendly and easily accessible through different devices, but simple to understand. The facilitation of social media and other platforms for webinars, documentaries, etc. need to be managed by *professionals.*

5   PERFORMANCE MONITORING

The following metrics will provide the data needed to assess whether the NSW has succeeded or not. There is a need for more data, and then the following process will be considered for the actual collection from the tools that have been mentioned in this document.

Table 4: Performance monitoring

Tools	Type of data	
Online event registration	• The number of people registered or sign-up to attend the webinar. • The number of the registered people managed to attend (showed up). • The number of those that watch the event after it took place. • The number of e-mails with NSW banners and signatures shared / sent	
Physical registers	Registers from all the face-to-face events	
Event engagement	Analysing the type of comments and questions from the participants.	
Website traffic	Website traffic and host / link the events on the website	
Main-stream media	Listenership/viewership/readership of the programmes on radio / TV / Online	
Social media	The number of responders to the posted activity and engagement within the event, and those after the event has ended.	
	Facebook	Followers, comments / reactions, like, ,
	Twitter	Followers, responder, retweet, sharing
	YouTube	Subscribers, watchers / viewers, comments
	Webinars	Registers, Qs / comments, watchers / viewers

ANNEXURE A: DOCUMENTARIES AND WEBINARS SCRIPTS

TOPIC 1:	The history and evolution of vaccines
BACKGROUND:	The use of vaccines to save lives has been with people for many years. Although there doesn't seem to be consensus on when the use of vaccines started, some sources claim that their use began as early as 200 BCE. If there is truth in this, the anti-vaccine movement currently gaining ground in the wake of the COVID-19 pandemic casts doubt on people's understanding and appreciation of the role of vaccines in saving lives. It is also worth noting that the World Health Organisation (WHO) has since expressed concern about what is seen as 'vaccine hesitancy' – which the WHO now considers one of the top 10 threats to the world public health. The documentary will seek to build public knowledge on and awareness of vaccines

NARRATIVE	SUGGESTED		LEAD INSTITUTION
	VISUALS	ROUNDTABLE DISCUSSION	
The genesis and development of vaccines is explained, with some ground-braking contributions by South African scientists in the production and application over the years. Animations will complement the narrative and visuals to demonstrate among other things; the behaviour of virus in the body. How did the concept of vaccine and immunisation start and developed over the centuries?	**Visuals:** Scientist / expert explaining the genesis and exodus of (outline of timelines since the Early Chinese Inoculation (1000) to COVID-19 Vaccine (2020)) of vaccines. Furthermore, to cover the different eras of life wherein different pandemics were eradicated due to vaccination. The following questions will be answered: • What is vaccine? • Different between vaccination and immunisation. • Animations demonstrating – how vaccine works? • How vaccine is developed, stored, transported? • Other vaccines available for babies… Educational animations and real-life visuals to actively teach the citizens on how vaccines work, how vaccines are made, how to visualize risk, and more. The documentary will also explore the past, present, and future of vaccination and infectious disease.		TBD (based on the evaluation of proposals)

	Facilities tour and profile of different professions that are involved in the development and management of vaccine. The basic science concepts that are the building blocks of vaccination	
Does South Africa have the research and scientific capabilities to understand the viruses in order to provide the relevant solutions?	Career awareness; by explaining different careers / fields that are involved in the development of vaccine.	**Online and radio stations**; profile of different professionals that are involved in the value-chain of vaccine development.
Does South Africa have policy and regulatory that are credible in the determination of relevant vaccines?		**Webinars:** More than the science behind vaccines, these timelines cover cultural aspects of vaccination. COVID-19 Coronavirus vaccine myths and facts. Panel of experts to explore the fact that although the time periods have changed, the emotions and deep-rooted beliefs—whether philosophical, political, or spiritual—that underlie vaccine opposition have remained relatively consistent since Edward Jenner introduced vaccination.

TOPIC 2:	Technologies are changing the future of work – understanding the Fourth Industrial Revolution and Artificial Intelligence.
BACKGROUND:	There is no turning back, the world of work has been changing gradually. And lately, that change is obviously on the rise and bound to accelerate over the next years, driven by technologies. These days, discussions about the future workplace or future of work are all about artificial intelligence. The documentary will attempt to answer explain what the Fourth Industrial Revolution (4IR) is all about, including its link to artificial intelligence (AI); explore South Africa's readiness to fully participate in 4IR, as well as exploring career-related issues linked to 4IR.

NARRATIVE	SUGGESTED		LEAD INSTITUTION
	VISUALS	ROUNDTABLE DISCUSSION	
If the talk now is about the 4th Industrial Revolution, it means the world has gone through the three earlier eras. What were the earlier eras all about?	• An expert outlining the three earlier eras.		TBD (based on the evaluation of proposals)
	• Highlights dominant or popular technologies that characterised each era.		
What 4IR entails and its links to AI.	An expert unpacking 4IR and its intertwines with AI.		
How does AI change the workplace?	• The Sandton-based Hotel Sky provides visitors with AI-based support, including luggage portage, room service deliveries and answering questions about the hotel and surrounding areas.		
	• Some existing industrial robotic solutions – ranging from those in the market and existing industrial applications.		
What skills are needed for 4IR?	An expert advises young people on: • the personal attributes for 4IR and the route to develop them; and • new career paths brought about by 4IR.		
Does South Africa have appropriate policy and regulatory environment to enable the country adequate participation in 4IR?		• Possible webinar examining if South Africa is on the right track to adequate participation in 4IR	

TOPIC 3:	An understanding of mobile broadband as a stepping stone for the debunking of the myths about the 5G technology.
BACKGROUND:	When the 3G technology was introduced some years back, some people perceived it to be referring to the dongle that is connected to the computer for the access to the wireless broad band. While the understanding gained ground and still remains in some quarters of society, the introduction of the 5G technology currently underway is surrounded by health risk myth. In April 2020, the United Kingdom (UK) experienced the deliberate destruction of 5G towers by fire. The same kind of behaviour was seen in South Africa when people destroyed three cell phone towers by fire in KwaZulu-Natal province. In all these instances, the destruction of the mobile phone infrastructure is fuelled by conspiracy theories that falsely link the spread of the coronavirus pandemic to the roll out of 5G technology. If the correct perspective about the 5G technology is not put out there, the false information will continue to gain ground and to the detriment of South Africa's development.

NARRATIVE	SUGGESTED		LEAD INSTITUTION
	VISUALS	ROUNDTABLE DISCUSSION	
Is there any link between G5 and COVID-19?	Documentary will devote resources to removing content linking 5G technology to COVID-19.The following visuals will be filmed alongside the experts explanations, interviews and demonstrations: - How viruses (COVID-19) are transmitted? - How radiation are transmitted? And the acceptable limit of these different frequencies & radiation. - Show the dongle, sim card and explain what they are and their functions. - The difference between 5G and previous generations of mobile services (4G, 3G) is that the latter uses lower radio frequencies. (Differentiate between 3G/4G/5G/wireless& LTE infrastructure). Advantages of using 5G over 4G and 3G. - Animations to demonstrate / explain few known frequencies in an electromagnetic spectrum.		TBD (based on the evaluation of proposals)
How significant is the use of 5G technology in the improvement of life?	- Virtual hospitals/wards and classrooms - Online learning - Drones; delivery, filming, surveillance, - Driverless cars - Events		
Two worlds apart: viral and signal. Do they influence each other?	The protein shell of the virus is incapable of hijacking 5G radio signals. This is because radiation and viruses exist		

	in different forms that do not interact. One is a biological phenomenon and the other exists on the electromagnetic spectrum.	
Is there any evidence that 5G transmit COVID-19?	Engagements to be posted on social media: • There has been a lot of talk on social media lately suggesting a connection between COVID-19 and 5G technology. There is no evidence that exposure to 5G networks is the cause of the coronavirus.	**Webinar:** A panel of experts discussing to debunk the myth that 5G transmit COVID-19, (How 5G networks operates and its effects on human health).

TOPIC 4:	Science as a way of unravelling natural phenomena and predicting the future: The South African COVID-19 pandemic case study.		
BACKGROUND:	Science can be defined as the systematic examination of the structure and functioning of the natural world, including both its physical and biological attributes. Science is also a rapidly expanding body of knowledge, whose ultimate goal is to discover the simplest general principles that can explain the enormous complexity of nature including natural phenomena. These principles can be used to gain insights about the natural world and to make predictions about future change. The major alternatives to science are belief systems that are influential in all cultures, including those based on religion, morality, and aesthetics. These belief systems are primarily directed toward different ends than science, such as finding meaning that transcends mere existence, learning how people ought to behave, and understanding the value of artistic expression. Compared with modern science, however, studies in natural philosophy used unsophisticated technologies and methods and were not particularly quantitative, sometimes involving only the application of logic. Pandemics are large-scale epidemics afflicting millions of people across multiple countries, sometimes spreading throughout the globe' (World Health Organization (WHO), 2010). Over the last couple of centuries, a number of pandemics have been reported causing threats for humankind (Taylor, 2019). On 11 March 2020, the WHO officially declared COVID-19 as a universal pandemic (WHO, 2020d). Pandemics like coronavirus create not only an epidemiological crisis but also a psychological crisis (i.e., anxiety, depression, insomnia, trauma, anger, psychosis, panic and boredom) like the other pandemics in the past.		

NARRATIVE	SUGGESTED		LEAD
	VISUALS	ROUNDTABLE DISCUSSION	INSTITUTION

Describe the nature of science and its usefulness in explaining the natural world.	Experts describing the nature of science and its usefulness in explaining the natural world. The following concepts will be addressed: *Mutation and Variant.*		TBD (based on the evaluation of proposals)
Will vaccines work against the new COVID variants? Scientists race to find out	The recent emergence of new COVID-19 variants across the world has left scientists searching for answers once again as they try to understand what these changes mean for the pandemic - and vaccine roll-outs.		
	Scientists explain and demonstrate the scientific (or numerical) models used to predict and interpret the natural phenomena: • Covid-19 • Hurricanes and cyclone • Veldfire		
Distinguish among facts, hypotheses, and theories.	Outline the methodology of science, including the importance of tests designed to disprove hypotheses. Touring the CapeBio facilities in Centurion, Pretoria		
Discuss the importance of uncertainty in many scientific predictions, and the relevance of this to environmental controversies.		**Webinar:** The identified a rapidly spreading new variant of SARS-CoV-2, the virus that causes COVID-19. The new variant, called 501Y.V2, raises critical questions – including whether current vaccines and treatments will still be effective.	
Due to the outbreak of COVID-19, the mental health of the people all around the world is severely disrupted		The impact on future workforces' career anxiety at the first place and whether depression from COVID-19 has any indirect effect on 'Fear of COVID-19' and future workforces' career anxiety due to 'Fear of COVID-19'.	

TOPIC 5:	Can South Africa be considered influential in science, technology and innovation?
BACKGROUND:	Through a global eye, South Africa might not be considered as having a strong influence when it comes to STI but the country has proved over many years to be on the right track by accomplishing ground-breaking science and enhancing the well-being of all South Africans and that of the world. There are many SA inventions that the country pride itself with and that are being utilised throughout the country and internationally. These inventions have changed both the country and the world for the better. To mention a few of these are the economic solar power (2005); computerized ticketing (1971), automatic pool cleaning and Pratley Putty (both in 1960s), Retinal Cryosurgery (1965). During 2020 the country was also restlessly working with the world in alleviating the Covid-19 situation and has played great part too. This has led to the production of ventilators, test kits, Oxygen-Efficient Respiratory Aid, amongst others, which benefitted a lot of citizens during the pandemic.

NARRATIVE	SUGGESTED		LEAD INSTITUTION
	VISUALS	ROUNDTABLE DISCUSSION	
What are some of the local inventions and discoveries, as well as the scientific areas in which South Africa has geographic or knowledge advantage?	During the second wave of COVID-19 infection in South Africa, local scientists due to their excellent genomic surveillance discovered a new variant of SARS-CoV-2, referred to as 501. V2.		TBD (based on the evaluation of proposals)
	iThemba LABS and Wits collaborate on COVID-19 Monitoring Tool		
	3D mask printing - Natalie Raphil is the founder of Artificial Intelligence company Robots Can Think South Africa.	Discussion on 3D printing, what it is & what are its impact	
	Doctors are calling this new South African invention a game changer in the fight against COVID-19. This proudly South African invention, named OxERA (Oxygen-Efficient Respiratory Aid)	Discussion on SA inventions – Covid related	
	Addressing bottlenecks in SA Covid 19 testing	How they were involved, how these were made and their role in the whole project	
	SA Contribution to the ventilators	Their contribution to the development of the ventilators	
	University of Limpopo medical scientist Professor Tivani Mashamba-Thompson together with Ellen Crayton of Genesis Technology and Management in the US have pioneered a low-cost block-chain system for tracking and monitoring Covid-19 infections in rural settlements.	The advantages of this low-cost monitoring tool as well as the limitations of this technology, especially in rural areas which is their primary market	

	Professor Feroza Motara and her team – Charlotte Maxeke Hospital have come up with the innovative INTUbox which is aimed at protecting healthcare workers when they assist patients withCovid-19.	Innovations aimed at protecting front line workers – how it started, those involved and impact	

TOPIC 6:	A perspective on how scholars perceive attitudes to science in policymaking in South Africa
BACKGROUND:	Policymakers are a vital group with whom scientific research should be communicated, especially when the reason for many research projects is linked to relevance for socio-political and economic management. Science communication has a vital role in transforming research into policy, and a core element of this process is understanding the target group, namely policymakers. Science and policy influence each other deeply, so researchers and policymakers should improve their understanding of each other and of the processes involved in both fields in order to better collaborate. Accordingly, an in-depth understanding of how scholars perceive policymakers is a precondition for scientists to achieve any desired management and policy impacts.

NARRATIVE	SUGGESTED		LEAD INSTITUTION
	VISUALS	ROUNDTABLE DISCUSSION	
Are the research outputs accessible to inform the policies in South Africa? Is research relevant?	**Documentary:** To answer this question, the documentary will make reference to the White Paper on Science, Technology and Innovation in pursuit to articulate its objectives and key messages		TBD (based on the evaluation of proposals)
Why do researchers do what they do?	Examples of different researches that have been conducted in South Africa that have responded to the challenges faced by society. Outline of the process that lead to the formulation of research focus area		
Does South Africa invest enough towards research and development?	Universities and science councils that are conducting different research based on their focus areas. Outline the available tools setup by government to support research and development and detailed processes that one can follow to access research funding.	**Webinar:** Policymakers: DSI and entities to address the opportunities and available instruments that have been set aside to support research and development	
Science communication	**Publications:** Featured articles in science magazines like Quest Magazine with a simplified version of a particular research output of interest.	**Webinars:** Publics engagement with the panel of experts about their research outputs.	

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What are the potential career opportunities for researchers in South Africa?	Career awareness profiling researchers as professionals in their day-to-day work. Interviews of the researchers. The awareness can also be done through a theatre kind of activities with a storyline that portray the different roles played by different people in the scientific research value-chain.		

TOPIC 7:	Physics and my village		
BACKGROUND:	This sub-project was inspired by the National Rugby series on Chasing the sun in South Africa which tells the story of rugby in South Africa. It is proposed that physics can benchmark something similar for South Africa. We as physics have similar battles, e.g. shaping the future of physics story, attracting women and girls into physics, learning physics in a rural setting with no lab and having to improvise, the SKA coming to South Africa among other stories. However, besides these daily struggles, there is development, change, the improvement that physics has brought to our education, opening windows to careers and futures, and basic necessities that physics has brought to our villages and townships. So, thinking of physics in our everyday life and Physics and My Village, one may be asking the question What has science done for my village "My Village"? Solar physics has enabled refrigeration of vaccines at rural clinics, etc. . The aim is to highlight the struggle for physics excellence amid chaos and what good physics is bringing to our villages.		

NARRATIVE	SUGGESTED		LEAD INSTITUTION
	VISUALS	ROUNDTABLE DISCUSSION	
How physic evolved over the years and informed new development	List of the latest Physics discoveries over the past 150 years which informed the important things of today's life such as the internet, quantum mechanics, robotic, communication, health, etc.	Documentary	TBD (based on the evaluation of proposals)
Which are the main contribution of physics to our daily life?	Describe how Physics theories and predictions informed the development of technologies that we use today		
What is the importance of physics in our daily life?	Physics extends well into your everyday life, describing the motion, forces and energy of ordinary experience. In actions such as walking, driving a car or using a phone, physics is at work.		
Is the role and relevance of Physics communicated enough in the interpretation of natural phenomena?	Create a blog where people contribute how physics has improved their village – send photos and videos	Webinar: Panel of experts to discuss the importance of Physics as a field of study to understand the behaviour and interpretation of nature.	

The role of South Africa in the body of knowledge.			
Is Physics a difficult subject to teach and learn?		**Webinar:** Teaching and learning support online workshops for teachers and learners to tackle challenging topics on how to teach them.	

ANNEXURE B: EXAMPLE OF WEBINARS DETAILED ADVERT

TOPIC 1: Dismantling Covid-19 5G myths. Debunking of the myths about the 5G technology.
Date: 1 August 2021
Time: 11:00 – 12:30
Host: Council for Scientific and Industrial Research (CSIR)

Join us for this online discussion forum hosted by the CSIR.

Background

There has been a lot of conspiracy theories linking the 5G technology and COVID-19 all over the world. When the 3G technology was introduced some years back, some people perceived it to be referring to the dongle that is connected to the computer for the access to the wireless broad band. While the understanding gained ground and still remains in some quarters of society, the introduction of the 5G technology currently underway is surrounded by health risk myth. In April 2020, the United Kingdom (UK) experienced the deliberate destruction of 5G towers by fire. The same kind of behaviour was seen in South Africa when people destroyed three cell phone towers by fire in KwaZulu-Natal province. In all these instances, the destruction of the mobile phone infrastructure is fuelled by conspiracy theories that falsely link the spread of the coronavirus pandemic to the roll out of 5G technology

PLATFORMS	EVENT OBJECTIVES:	OUTPUTS:	THE SPEAKERS:
Zoom YouTube Facebook Twitter	How viruses (COVID-19) are transmitted? • How radiation are transmitted? And the acceptable limit of these different frequencies & radiation. • Show the dongle, sim card and explain what they are and their functions. • The difference between 5G and previous generations of mobile services (4G, 3G) is that the latter uses lower radio frequencies. (Differentiate between 3G/4G/5G/wireless& LTE infrastructure). • Advantages of using 5G over 4G and 3G. • Ascertaining how far the roll-out of 5G is in South Africa	The panel discussion will simplify some of the difficult concepts of ICT, particularly 5G demystify the allegation that has made some rounds on the media bout the health effects, including the spread and mutation of the SARS-CoV-2 virus, Covid-19 vaccines and whether or not there can be a link between these and 5G mobile technologies.	• List of experts and/or panellists

ANNEXURE C: MAINSTREAM MEDIA (RADIO)

Most people in South Africa rely on mainstream media as the source of information due to its historical ability to reach even the most remote areas. Mainstream media is everywhere, and encompasses television, print, radio and certainly the internet, in the form of online publications. Because of its huge command of viewership, mainstream media attracts a lot of people and has been considered as a useful instrument to get the masses of South African participate in the NSW in one way or another. Printing media will not be used in the NSW 2021 due to its potential of spreading COVID-19, resulting in having television, radio, and online as the medium to be used in the NSW 2021. Instead of printing, the NSW 2021 will provide sign language for at least one documentary order to include the deaf community.

Radio is one of the medium that is accessible to more people and the 18 SABC radio stations occupy that space because of their ability to offer all 11 official languages in South Africa. These radio stations will be used as platforms to engage more people during the focus week. Radio shows/programmes such as the morning and afternoon drive shows, educational shows, sport shows and news attract more listeners due to their strategic timing and normally give a boost needed on daily basis. The details of the breakdown of listeners per station and those shows is in Table 2 below.

- *Radio show and programmes:* DSI/SAASTA will sponsor these shows and have the NSW 2021 content or topics covered with scientists/experts featured to explain and answer few questions just for 10 to 15 minutes daily. Presenter(s) of the show will read the NSW scripts after every news bulletin to encourage the listeners to join webinars and watch documentaries. Each show will be wrapped with a quiz to test the knowledge of the listeners with prizes such as educational vouchers, internet data, tablets, etc. Questions for each show will be sent to the radio stations by DSI/SAASTA. The exercise will be accompanied by numerous NSW adverts.
- *Live feeds:* updates reports randomly fed to different radio stations during the day. This will afford opportunity for scientists/experts from HEIs, science councils, DSI/SAASTA to be interviewed in all 11 official languages. A minimum of five subject matter experts per language will be identified form science councils and HEIs, at least one person per day per radio station and be featured for these interviews in 18 SABC radio stations. Furthermore, 36 community radios, especially those that are HEIs campus-based will add value. SABC Education will be approached to facilitate the participation of the SABC radios in their education programmes like Science and Technology, Health and Environment, and Learners and Teachers Support.

Content dissemination: Educational radio broadcasting

The SABC has 18 radio stations, with more than 25 million weekly listeners. Table 5 presents the names of these 18 radio stations, coverage and languages, their current weekly listenership (reach) and possible shows to be targeted for content dissemination.

Table 5: Dissemination of content through 18 SABC radio stations – SA's official languages

Coverage (province)	SABC radio station and languages	Listenership	Morning Drive shows (6 – 9 am) 85 shows	Approach	Other Educational shows 18 shows	Delegate
National	1. SAfm (Eng)	593,000	AM Live	**Live Reads:** Scripts regarding the NSW 2021 webinars and documentaries will be provided to the radios to be read live or pre-recorded by the hosts of the morning live drive shows communicating interesting or important information that is relevant to their lives, and through a holistic campaign that offers variety and, where possible entertainment. **Featured Scientist:** Featured scientists/experts to answer the daily question in the language used by the station. 5 – 10 minutes. **Quizzes:** Every day one quize based on the Live Reads and Featured Scientist information. Listeners can win prizes ranging from educational vouchers, data, etc.18 winners per day (one per station).	Weekly Science and Technology show (30 minutes). Radio stations to host scientists / experts or policy-makers to discuss in detail the content of selected documentaries in all official languages.	Scientists Researchers Policy makers Science interpreters
	2. RSG (Afri)	1,893,000	Goeie More			
	3. Radio 2000 (Eng)	908,000	The Take Off			
	4. Metro (Eng)	6,309,000	Morning Flava			
	5. 5FM (Eng)	1,878,000	The Roger Goode show			
KZN	6. Ukhozi (Zulu)	7,623,000	Isidlolo Sasekseni			
	7. Lotus(Eng)	351,000	Breakfast express			
LP	8. Thobela (Ped)	3,335,000	Ditlalemeso			
	9. M Lonene (Tson)	1,048,000	Phaphama			
	10. Phalaphala (Ven)	936,000	Vhandilani			
N C	11. Xu & Khwe					
W C	12. Good Hope(A&E)	701,000	Big Breakfast			
E C	13. U Wenene (Xho)	4,467,000	Ibrakfesi Eyondlayo			
	14. Tru FM(X&E)	218,000	Trumorning			
NW	15. Motsweding (Tsan)	3,324,000	Di Rage			
FS	16. Lesedi (S Soth)	3,968,000	Monate Breakfast			
MP	17. Ikwekwezi(Ndebele)	1,855,000	Vum Vum			
	18. Ligwalagwala(Swat)	1,522,000	Kusile Mzansi			

ANNECTURE D: ICT PLATFORM

ICT platform that would cater for the said requirements with possibly the following features:

- *Event Features:* A platform that is a browser-based service. That means a platform that will work on any device where guests don't need to download any software or plugins.
    - Single or multi-track events
    - Multi-day events
    - Panels with 10+ speakers
    - Speaker screen share and presentations
    - 3D rendered poster sessions and study booths
    - Available on any platform
    - No software required for any guests
    - Custom program setup
- *Networking*
    - Engaging live video wall with polls and chat (*Possibly for virtual exhibitions*)
    - Live chat wall in each auditorium
    - Breakout sessions
    - Scheduled video meetings with participants or exhibitor (*Possibly for documentaries)*
    - Interactive audience networking features
    - Social media integration
    - Guests can build contact lists across events
    - Upload text and documents to booths and video walls
- *Resources*
    - Organizer can upload different documents and video links through the resources section from the back end.
    - This will enable the guests to view documents and video links and download them too pertaining to the event.
- *Registration and Guest management*
    - Process payments from audience and exhibitors
    - Custom confirmation emails
    - Let guests sign up with social media credentials
    - Send emails to participants before, during and after event
- *EXPO Features*
    - Plug and play exhibitor booth setup
    - Upload logos, marketing material and videos to booths
    - Custom avatars to represent exhibitors
    - Easy navigation around expo hall
    - Multiple exhibitor halls available
- *Virtual Booth/ Exhibitor Booth*
    - Chat/ Video Call with booth representatives
    - Access to the exhibitor's social media pages and websites
    - Ability to view brochures and other files uploaded by the exhibitor
    - Ability to view videos
    - View Market Place/ Products featured by the exhibitor or Jobs instead of Market Place

- o Interact with each other on booth walls
- *Webinars Live and Pre Recorded Videos*
  - o Live audio video of the speaker
  - o Multiple speakers for speakers
  - o Live questions and answers paragraph and chat features
  - o Broadcast the webinar within the platform (without any other
  - o browser or program download)
  - o Surveys
  - o The ability to share the screen for the speaker s
  - o The ability to modify and control the participation of the
  - o speakers through (delete, ban, remove from rooms
  - o Registration and reporting of user attendance
  - o Call and email reminders
- *Reminders/ Push Notifications/ News*
  - o Push notifications are an essential tool in our virtual platform, giving the organizer the ability to target messages to participants, at any time they desire.
  - o With push notifications, you can send a message directly to the audience alerting them of any new jobs posted or any upcoming live talks inside the auditorium
- *Design*
  - o Photorealistic virtual lobby, auditorium and exhibitor space
  - o Unique design to match the identity of the exhibitor
  - o Branding features for organizer and sponsors
- *Support and Customization*
  - o Support team available through planning and during event
  - o Set up your own event
  - o Custom setup and design by the service team available
- *Video Features*
  - o Stream video from: Zoom, Teams, Skype, Facebook, Messenger, YouTube and more
  - o Live and pre-recorded video presentations
  - o Create archive with recorded events for on-demand participation
- *Statistics and Reporting*
  - o Detailed event statistics
  - o Google Analytics integration
  - o Reports and monitoring for organizer

ANNEXURE E: SOCIAL MEDIA

Provide a platform for science professionals / experts that are celebrities (crowd pullers) to host discussions / talk shows on the selected topics to be decided with more users giving people to engage / interact. Videos are saved and be shared later.

ANNEXURE F: MARKETING AND BRANDING