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National Science and
Technology Forum

Media Release

S.E.T. for socio-economic growth

Creative economy, science and the 4IR

The creative economy is of immense value to citizens and society. It stimulates employment, generates income, makes important contributions towards the Sustainable Development Goals (SDGs), and is the expression of imagination, emotion and social insights. South Africa is filled with creative and innovative people who bring these qualities and benefits to light, but many struggle to make a living. This then asks that we look at how creative work can thrive in the era of the Fourth Industrial Revolution (4IR), and how digitalisation and emerging technologies can create new forms of cultural experience, dissemination, and business models.

The NSTF provides neutral collaborative platforms where issues and sectors meet

- One of the National Science and Technology Forum (NSTF) functions is to hold [Discussion Forums](#), bringing the private and public sector together to address important issues and engage with government policy.
- Feedback from these [Discussion Forums](#) is given to role players and stakeholders.
- [Recommendations](#) are put forward to government as part of the SET community's (science, engineering and technology) efforts to make input into SET-related policies and implementation.
- The NSTF [represents over 120](#) member organisations participating as key stakeholders of the SET and innovation community.

The [National Science and Technology Forum](#) (NSTF) hosted a two-day discussion forum on the [creative economy, science and the 4IR](#). The event took place from 2-3 March 2022 and focused on intellectual property, emergent technology, and how the creative economy connects with science, engineering and technology (SET) and innovation.

Importance of innovative thinking and digitalisation

Dr Tegan Bristow, Senior Lecturer and Director: Fak'ugesi Festival (fakugesi.co.za), University of the Witwatersrand (Wits); and Winner: 2021 NSTF-South32 Special Annual Theme Award: Creative Economy for Sustainable Development, started the conversation around the '[Importance of innovative thinking in the era of the 4IR](#)'. Bristow said that through the work done by Fak'ugesi and digital technologies, she found that throughout the festival, people looked at the creation of art and technology as a business. Individuals across different disciplines connected to create interdisciplinary solutions that can fundamentally change how organisations and people approach creativity and innovation. Bristow also spoke around how the Presidential Commission on 4IR in 2019 has played a role in kickstarting industry engagement and how it ignited cross-sector innovation and collaboration.

She concluded by saying: “We all live within a digital economy that can contribute to human capital, creativity and allow for the transformative blend of STEM (science, technology, engineering, maths) with STEAM (science, technology, engineering, arts, maths). However, right now it’s hampered by underdeveloped infrastructure and resources with limited access to consistent digital education. The value is clear, but growth needs to come from 4IR strategy, agile governance, anticipatory policy and regulation, and private sector engagement”.

Innovative thinking and solutions differentiate man from machine

Professor Tshilidzi Marwala, Vice-Chancellor of the University of Johannesburg (UJ), author of Closing the Gap (about the 4IR), among others; and Winner of two NSTF Awards, reinforced the value of multi-disciplinary educational experiences and approaches when focusing on ‘[Innovative thinking within the remit of 4IR](#)’. He highlighted how the pandemic has disrupted lives and 4IR has become a tool to help navigate the pandemic, providing communication, the technology for vaccine development, monitor patient health, and harness converging technologies to create a human-centred future.

He believes that innovative thinking – the ability to come up with new ideas and intriguing solutions to problems – is a skill that differentiates man from machine, and that Africa sits on the cusp of a revolution and evolution. Like Bristow, Marwala believes that innovation and creativity need to be supported by public and private sector alike, to put Africa on the global stage with innovations that will shape the future. It is important, he says, to create multi-disciplinary educational experiences and to reimagine how education perceives creativity. It is not how clever you are, but how many questions you ask.

The NSTF Awards, since 1998, recognise outstanding contributions to science, engineering, technology (SET) and innovation in South Africa:

- Known as the ‘Science Oscars of South Africa’, the [NSTF Awards](#) profile scientific research that is professional, innovative, forward looking and relevant to both SA and the rest of the world.
- The solution-driven work of the [Award Winners](#) raises awareness among the general public about local research and its relevance to socio-economic issues.
- Award Winners are profiled to the [Youth as role models](#) through the NSTF Share ‘n Dare Programme providing [inspirational and knowledge sharing talks](#) to encourage them to study in SET-related fields.

Non-Fungible Tokens (NFTs) and Intellectual Property (IP)

Starting off the IP conversation, **Mr James McCarthy**, Director: McCarthy Legal, unpacked the topic of ‘[NFTs and the role they play in the market from the perspective of intellectual property](#)’ (IP) for artworks and images. The term non-fungible means unable to replicate which is important as this guarantees the authenticity of the tradable token and allows for it to be traded according to a digital ledger – blockchain – that shows where it was traded and at what price. These transactions are characterised by their transparency so buyers can see where they originated and where they are going and how much they’ve sold for. It is a trustworthy source of information that allows for the protection of creative IP but has recently shifted into a hype bubble that’s seen digital images sold for as much as \$23 million. However, this bubble is likely to become a stable form of IP protection for artists looking to NFT their works, creating digital images of their tangible assets as it allows for them to be traded and secured easily.

NFTs are essentially a digital representation of an asset that cannot be duplicated which means they can potentially have applications across multiple sectors and disciplines and can be used to reduce fraud and counterfeiting. The IP stays with the artist and allows for them to ultimately benefit from the transactions.

Innovation important for the country's transformation

Dr Audrey Verhaeghe, CEO: South African Innovation Summit (SAIS) continued this discussion by looking at the ['Commercialisation of IP'](#). While looking at the impact of early-stage funding and the sectors that are ripe for disruption in Africa, she unpacked the importance of innovation and transformation of the country. Verhaeghe believes that it is important to work on overall perceptions when it comes to the commercialisation of IP – the private sector needs to be respected for its drive, not its money; tech start-ups and small businesses are very different and need to be treated as such; and South Africa is part of Africa and the world. She also highlighted the importance of getting more early-stage support for budding tech entrepreneurs and funding to drive overall commercialisation.

Rights of creators and innovators

Then **Jansie Niehaus**, Executive Director at NSTF, unpacked ['IP, culture and the creative industries'](#) in a presentation prepared by **Tecla Spiller**, a law student at Wits. The presentation focused on the legal framework in which creatives function, something that few artistic individuals know about and that is important for them to understand.

Other presentations

- Prof Mike Bruton, Author: *'What a Great Idea'*; and Winner: 2002 NSTF Lifetime Award, delivered a presentation on how ['South Africans are resourceful, creative and innovative'](#).
- Prof Dshen Moodley, Associate Professor: Department of Computer Science, University of Cape Town (UCT); and Codirector: Centre for Artificial Intelligence Research, focused on ['Creativity and artificial intelligence'](#).

The presentation's objective was to provide a rationale for the adoption and protection of IP to give statutory expression to the rights of creators and innovators in their creations, and to balance this against public interest in accessing these creations and innovations. Combined, this contributes to economic and social development, which is why IP – that which refers to the creations of the mind – is protected in law.

The creative imperative

Mr Sipho Dikweni, Commercialisation Manager: Technology Innovation Agency (TIA), then looked at the ['Contribution of technological innovation in creative economies and correctly integrating 4IR technologies with creativity'](#). He examined how the creative economies can meaningfully contribute to the digital world and how 4IR has completely changed people's lives. Inventive business models, new forms of art, digital media and strategies, augmented and virtual reality, the metaverse – these are all blends of the creative and technological that are reshaping the world. Creators have to rethink their strategies to continue competing and contributing in this world, and they need to leverage emerging technologies and connectivity to unlock possibility. Whatever form of art is being created, technology can expand the audience, increase market access, and improve revenue but it won't happen without security and understanding how this digital economy works. Dikweni emphasised the importance of connectivity to all parts of South Africa alongside the opening of spectrum and giving people access to opportunity. And like every other speaker at the event, he believed that South Africa, and Africa, have immense scope for growth in this new digital world.

Mr Mbongeni Buthelezi, Artist, then spoke of his work and creative endeavours. Buthelezi is an artist who uses [waste plastic as his art](#) materials. He has been experimenting with this unusual form of art for the past 31 years – starting out at an art centre in Soweto and using his limited access to resources as his inspiration. Unable to purchase supplies like oils and canvas, he looked around to see what he could use, and it turned out to be

plastics, particularly plastic bags. His is an art form that not only recycles, but transforms. For Buthelezi it allowed him to make a meaningful contribution while remaining true to his passion – art – and he spoke of how collaboration between scientists and artists can offer new and exciting ways for audiences to engage with issues, such as the health of the ocean.

Creative lessons learned

Several key themes emerged from the event. The first, that South Africa and Africa are host to innovative and creative people who have the potential to reshape the future through innovative thinking. To effect this change, there has to be increased access to education, multi-disciplinary skills development, connectivity, technology and support that will allow for people across all levels of society to engage with creativity and the emergent technology of 4IR. The second, that people need to have access to insights and technology so they can better protect their IP and engage with digital markets and audiences, globally. Finally, the event focused on how creativity and technology have become interconnected entities that can innovate off one another to disrupt and transform industry, the creative sector and the future.

The speakers or the spokesperson, [Ms Jansie Niehaus](#), Executive Director of the NSTF, can be contacted through media@nstf.org.za. Further information can be found on the [NSTF website](#) and the videos of the speakers can be found on the [NSTF YouTube channel](#).

Read about previous NSTF Discussion Forums related to the 4IR:

- [Internet of Things \(IoT\) technologies and 5G connectivity roll-out](#) (23 November 2020)
- [Manufacturing and minerals processing – 4IR technologies SA needs to acquire](#) (4 December 2019)
- [Implications of the 4th Industrial Revolution for SET, industry, society, and education](#) (11-13 September 2018)

About the NSTF

The National Science and Technology Forum (NSTF), established in 1995, is a broadly-representative stakeholder body for all science, engineering and technology (SET) and innovation organisations in South Africa, which seeks to influence policy formulation and delivery.

The NSTF Awards are unique in SA, recognising the outstanding contributions of individuals, teams and organisations to SET and innovation.

The science bursaries page provides information on bursaries and bursary providers for science, engineering and related studies.

STEMulator.org attracts learners and students to the exciting world of science, technology, engineering and mathematics (STEM). It provides a virtual world full of stimulating content to excite and inform the youth, including STEM career guidance. Established under the auspices of the NSTF proSET membership sector (Professionals in *science, engineering and technology*).

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