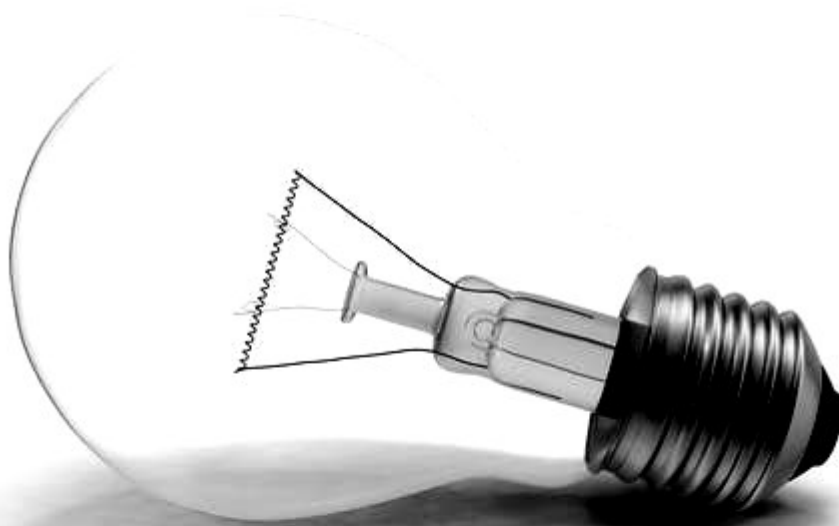


Innovation Office

News



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Director's note

I am excited to be part of the Nelson Mandela University, and to have the opportunity to work with innovative colleagues, researchers and students. Now, after a few months on the job, I am encouraged and appreciative of the work that has already been accomplished by my predecessors, Ms Jaci Barnett and Ms Leoné Nowell.

While the office went through several changes in 2018, we have continued to receive great support from both our internal and external stakeholders. We would like to acknowledge the funding support received from the National Intellectual Property Management Office ([NIPMO](#)), Southern African Research and Innovation Management Association ([SARIMA](#)) and Technology Innovation Agency ([TIA](#)), which has enabled us to continue to support the different technology transfer and commercialisation activities during the past year. We also recognise the excellent work being done at [Propella](#) Business Incubator.

On behalf of the Innovation Office team, I would like to thank all our researchers, partners, funders and stakeholders for their support, dedication to innovation and creation of new knowledge, which has made 2018 a success. We hope you enjoy reading about some of the projects and activities that occurred during 2018!

Nqobile

Director: Innovation Office

Let's connect



Get to know the Innovation Office

The Innovation Office assists researchers with innovation support (proposal and business plan development; prototype and proof of concept funding) and technology transfer (intellectual property management and commercialisation).

We nurture innovation, foster creativity, embrace technology, and develop people to meet the challenges of the world of tomorrow.



Meet the team



Dr Nqobile
Gumede

DIRECTOR

Manages and directs the activities of the Office and manages the commercialisation of the University's intellectual assets.



Mrs Elsa
van Wyk

DEPARTMENTAL SECRETARY

Provides secretarial, financial and logistic support services to the Office.



Ms Leoné
Nowell

INTERNATIONAL FUNDING & INNOVATION PROJECT MANAGER

Sources strategic funding and collaboration opportunities for the university and supports academics in competitive proposal development. Supports the technology commercialisation activities of the Office.



Ms Mante
Kgaria

TECHNOLOGY TRANSFER MANAGER

Provides support to the Director with the commercialisation of the University's IP Portfolio.



Ms Jessica
Preston

PR & MARKETING ADMINISTRATOR

Implements PR- and Marketing related actions linked to projects in the University's IP Portfolio.



Ms Esethu
Mdanyana

INNOVATION OFFICER

Manages TIA Seed Fund projects and provides IP administration support.



Ms Shannon
Smith

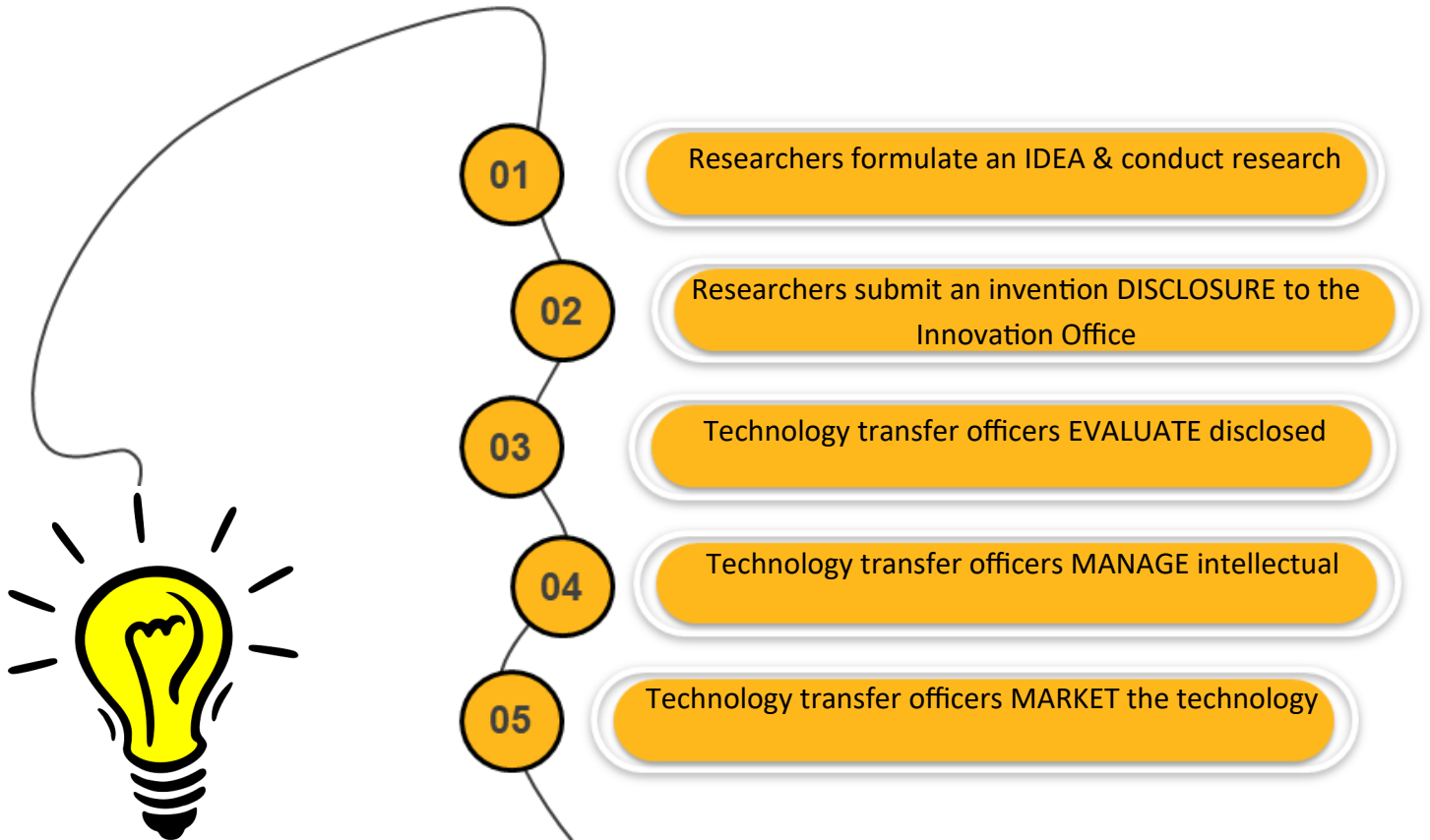
PR & MARKETING INTERN

Provides support to PR- and Marketing related actions linked to projects in the University's IP Portfolio.

2018 at a glance



Technology transfer process



TANKS™ and BOATS™ impact more than 2000 students

The coding introductory applications (apps), TANKS- and BOATS powered by Tangibl™ provided coding experience to more than 2000 kids during 2018. TANKS powered by Tangibl™ is an inexpensive programming tool that encourages the development of computing knowledge from a young age.

In November 2018, Prof Jean Greyling introduced BOATS powered by Tangibl™ : a two player Android app, which educates students on plastics in the Ocean while introducing them to coding. Players make use of tokens and image recognition to move their boat on a grid to “remove” plastics from the ocean. While existing solutions on the market require the use of a computer; and in some cases, additional hardware, the TANKS- and BOATS powered by Tangibl™ apps simply require paper tokens™ and a smart phone to introduce learners to coding concepts, making the experience accessible to more learners.

Prof Greyling has collaborated with several corporate sponsors to pursue the goal of introducing as many learners as possible to coding. Notable sponsorships include: BKB, who sponsored workshops for 400 children during National Science Week in Mveso; The Govan Mbeki Maths Development Centre, who bought 120 games which are used and distributed at their hub schools all over the Eastern Cape during STEAM (Science, Technology, Engineering, Arts and Math) workshops; and The State Information Technology Agency (SITA), who are sponsoring the roll-out of the games in 5 provinces. The SITA sponsored workshops reached 700 learners and culminated in 100 learners participating in the national computer hackathon competition at the Sandton Convention Centre in December 2018. Two pupils from the Eastern Cape took the number one spots in their respective grade categories during the finals. The winners share a R5000 cash prize for their schools, as well as other individual prizes.

Despite the enthusiastic response that the games are receiving, Prof Greyling expressed his frustration that in many of the very disadvantaged schools, learners do not have access to a smart phone. Future goals include corporate partnerships to supply these schools with tablets and the introduction of a structured weekly lesson plan for teachers.

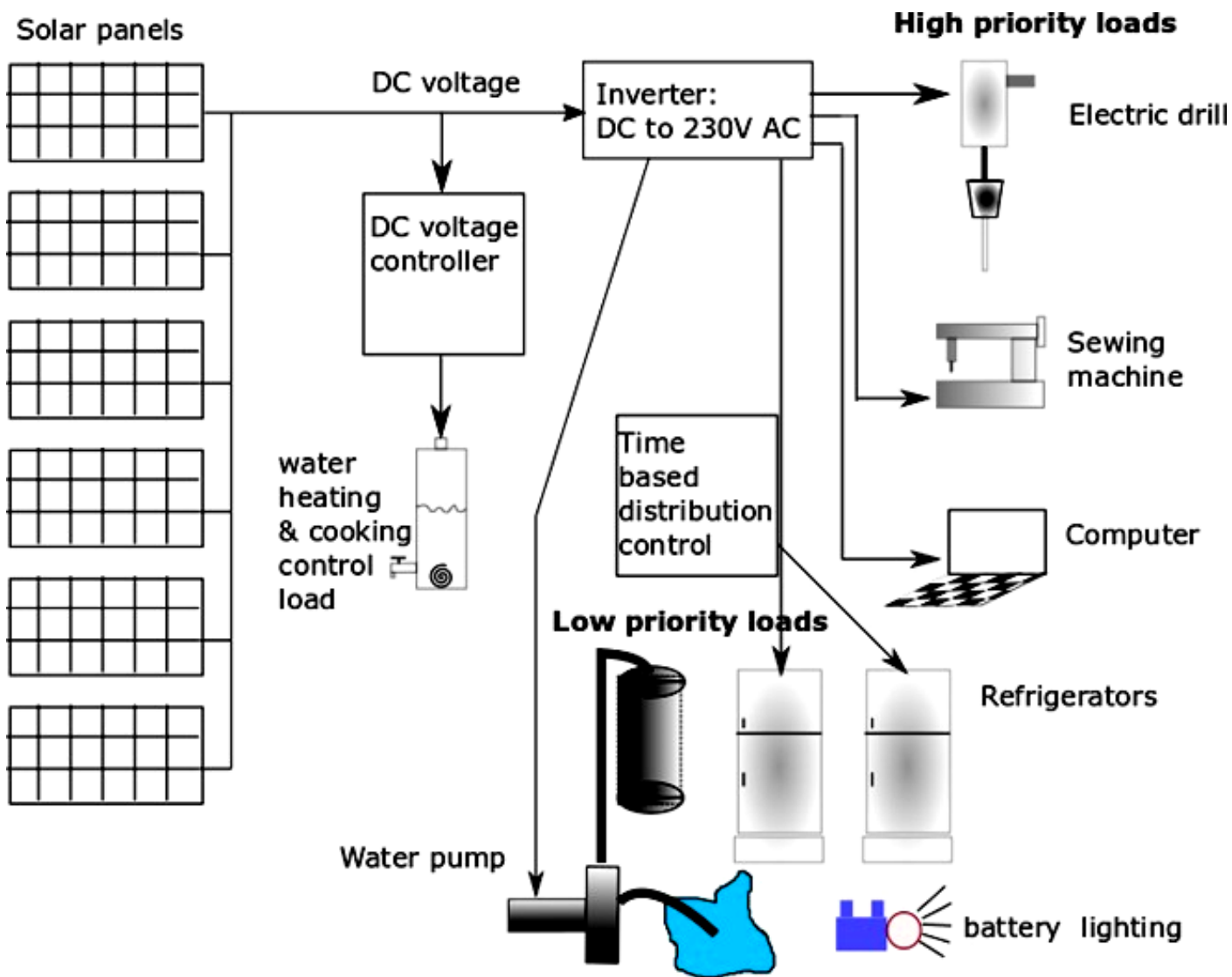


Cost-effective and reliable batteryless solar photovoltaic system

Nelson Mandela University Electrical Engineering Associate Professor, Peter Freere, and his postgraduate student, Edwin Ribisi, are developing a batteryless solar photovoltaic system. One of the primary expected benefits of the system is that it costs approximately half of the purchase amount compared to a battery-operated system. Further expected benefits include an increase in the system time between major maintenance from 2-5 years to 15-20 years; and the support of several large starting current loads (eg. several refrigerators) which is more than a standard solar photovoltaic system.

Electrical loads are designed to operate from a fixed voltage. This system ensures that the voltage supplied to the loads is fixed by altering the power sent to the regulating load - which is a low priority, variable voltage electrical load (e.g. water heater). Intrinsically, if there is spare power available from the solar panels, the spare power is directed to regulating load at such a level as to maintain a constant voltage for the other loads. This means that the solar panels will always produce their maximum output power. The regulating load will make effective use of any spare power, which can be used for cooking, the preparation of hot drinks or for washing or bathing.

In the event that the weather changes the amount of solar radiation incident on the solar panels, the regulating load is varied to allow the required power through to the higher priority loads. If there still is not enough energy available, other lower priority loads will be switched off.



Proposed batteryless photovoltaic solar energy system for income generation in off-grid areas.

Hybrid microalgae cultivation system

Microalgae are traditionally cultivated in open raceways or photobioreactors (PBRs). Both systems have advantages and disadvantages. The Nelson Mandela University's InnoVenton team is combining raceways and PBRs into a hybrid cultivation system which exploits the benefits of both systems simultaneously, while limiting the disadvantages.

The incorporation of PBRs in a raceway provides a number of benefits over traditional systems, such as: improved gas-liquid transfer, improved pH control, and larger light-capturing surface area leading to greater areal productivity. Open raceways are relatively cheap to construct, whereas PBR systems are far more expensive. However, productivity in raceways tends to be relatively poor, hence the adoption of PBRs in some cases - usually in high-value applications. The productivity of the hybrid system approaches that of raceways, but at a substantially lower capital cost.

Numerous commercial microalgae systems are operating around the world, targeted at a wide range of algae species and applications. Productivity and capital cost are two of the most important factors in the viability of microalgae cultivation, which are addressed by the hybrid system.

InnoVenton are experimenting with the cultivation of the *Spirulina* (*Arthrospira* sp.) "superfood" in the hybrid system. *Spirulina* are multicellular and filamentous blue-green algae that have gained considerable popularity in the health food industry and increasingly as a protein and vitamin supplement to aquaculture diets.



QSystems SA (Pty) Ltd yields promising results

QSystems SA (Pty) Ltd CEO, Heinrich Williams, received special recognition in the “most promising start-up or newcomer” category of the 2018 Advanced Manufacturing and Innovation Awards.

Williams developed a simple press device that enables patients with motor and physical disabilities to get the attention of healthcare staff with ease. The Qbell™ is an alternative nurse-call button that can be operated using the patient’s palm, chin, foot or other part of the body. The 3D-printed device uses the same power socket outlets as conventional devices so no electrical modifications are required.

Another QSystems SA (Pty) Ltd project is a reserved parking system that is access controlled through GPS communication and intelligence that can determine a smart phone’s position and automatically open a motorised barrier. The QPark system will protect the parking rights of people with disability and assist visitors who are unfamiliar with a city to find a map of available disability parking spaces reserved for them.

The first access control option entails a traffic light that turns yellow when a vehicle pulls into the space. The user has a short time to log into the QPark smartphone app. If the motorist is not a registered user, a siren will sound. Another system is a foot-high barrier in the parking space that can be lowered only by using the app. Users will be registered on the app with the help of the Association for Persons with Physical Disabilities’ database. The QPark system completed full production at Propella Business Incubator and will be completing its pilot phase. The system was presented to the National Council for Physically Disabled People in November and an interview on the popular radio station, 5FM, generated international interest.

Williams had to adapt to life in a wheelchair after contracting a bacterial infection which resulted in an abscess pressing against his spinal cord. With a diverse technical background in Electrical and Mechanical Engineering, he set out to meet some of the needs of people with disabilities.



uYilo snags Innovation Excellence Project Award

To meet the needs of the rapidly expanding electric mobility (eMobility) sector, the The uYilo eMobility Technology Innovation Programme - hosted by Nelson Mandela University's engineering innovation hub, eNtsa - aims to promote and develop the eMobility industry in South Africa.

In collaboration with its partners in the automotive industry, uYilo has a pilot fleet of electric vehicles and set up its smart-grid infrastructure at Nelson Mandela University's North Campus. uYilo incorporates a national accredited battery testing laboratory, an electric vehicle (EV) systems laboratory and a live vehicle testing environment. The battery testing laboratory is internationally accredited for the testing of lead-acid batteries and has extended its scope to include lithium-ion cell testing, making it Africa's first internationally accredited testing facility for lithium-ion batteries.

In March 2018, Hiten Parmar - the project leader and deputy director of the uYilo Programme, spoke at the Africa Clean Mobility Week, where 42 African countries met at the United Nations Environment Headquarters in Nairobi, Kenya, to explore opportunities for Africa to leapfrog to cleaner and more efficient mobility solutions. uYilo's commitment to the development and promotion of cleaner and more efficient mobility solutions saw the uYilo team winning Nelson Mandela University's prestigious Innovation Excellence Project Award for 2018 at its Research and Engagement Awards.

The uYilo e-Mobility Technology Innovation Programme was established in 2013 towards stimulating and intensifying eMobility technologies in South Africa. Initiated by the Technology Innovation Agency (TIA), a specialist agency of the Department of Science (DST) and

Technology, the Programme aims to identify and maximise value in niche technologies that South Africa has the capacity and capability to develop, or to add value to adapt to local conditions.



Innovation Excellence Award



Prof Paul Watts received the Innovation Excellence Award at the 2018 Nelson Mandela University Research and Engagement Awards function. Prof Watts joined the Nelson Mandela University in 2013 to hold the distinguished position of 'Research Chair in Microfluidic Bio/Chemical Processing'; now running a group of approximately 30 researchers. He has published of over 120 highly cited papers.

Prof Watts strongly believes that scientists should conduct research that impacts society; the biggest project underway involves the local production of key drugs for diseases such as AIDS, TB, malaria and cancer.

Disclosure campaign



The Innovation Office hosted a competition in March 2018 with the theme of "improving lives", which encouraged students and researchers to disclose innovations that would improve the lives of those around them. The winner of the competition and a Samsung tablet was Tisunge Mpakati, a 4th year BTech: Biomedical Technology student. Mpakati proposed the development of a natural gas powered incubator for infants, which will benefit areas with electricity access issues. Pictured is Tisunge with ex- Contracts Lawyer, Melanie Leitch.

#MandelaDay celebrations

The Nelson Mandela University Innovation Office, in collaboration with Buzz Projects PE and Uhambizo Consult (Pty) Ltd, celebrated Mandela Day at the SOS Children's Village Centre in Schauderville. The Children's Village provides an alternative setting for children who have been orphaned or whose parents are no longer able to take care of them.

The children received an enthusiastic presentation on water sanitation and water awareness from two water wise mascots: Thontsi and Ngasese. After the proceedings, the children enjoyed lunch and received goodie bags.



Celebrating World Intellectual Property Day

In celebration of this year's World Intellectual Property (IP) Day, the Nelson Mandela University Innovation Office hosted a lunch hour presentation on 9 May to raise awareness of the role that IP plays in innovation.

With this year's theme being "Powering Change: Women in Innovation and Creativity", Prof. Darelle van Greunen, Director of the Centre for Community Technologies, then spoke about her sources of inspiration and elaborated on her extensive experience in the innovation space. Dirk Hanekom, Partner at Spoor & Fisher, presented an overview of IP rights and discussed how inventions can be protected by means of registered designs, trademarks, copyrights and patents. He paid homage to key African women inventors and highlighted their contributions to society.



Lunch hour IP talks



As an extended celebration of World IP Day, the Nelson Mandela University Innovation Office, in collaboration with Von Seidels Intellectual Property Attorneys, held informative sessions on 15 and 16 May 2018.

Llewellyn du Toit presented an overview of IP rights and elaborated on the debate around "Patenting versus Trade Secrets" on 15 May. According to Llewellyn, an inventor's first question when coming up with a new invention is: "Should I protect my invention by filing a patent, or should I keep it a secret?". On 16 May, Érik van der Vyver discussed the IP and legal aspects surrounding Fintech - a new financial services industry composed of innovative applications, products, processes and business models aimed at improving financial activities. Both talks were very well received and sparked much engagement between the presenters and attendees.

Student Entrepreneurship Week



In celebration of #SEW2018, the Nelson Mandela University Innovation Office, in collaboration with Enactus and Propella Business Incubator hosted a lunch hour information and awareness session on 31 August.

Propella's Senior Industrial Advisor, Grant Minnie, led the talk entitled "innovating for a smart city". While there are varied definitions of what a smart city is, essentially the smart city concept addresses the current challenges that the citizens of a city face, through the use of ICT (information and communication technology) enabled infrastructure, particularly as it is applied to the economy, mobility and the environment (including safety and security). The objective of a smart city is sustainable development that results in improved quality of life and well-being of all citizens. The role of the citizens include identifying / conceptualising and configuring solutions is at the heart of the smart city concept. The smart city concept provides an opportunity for both established and emerging entrepreneurs to develop solutions to identified challenges.

The Nelson Mandela Bay SMART CITY initiative seeks to develop a smart city in Nelson Mandela Bay based on a partnership approach, to address social and economic challenges prevalent in Nelson Mandela Bay.

Konica Minolta International University Contest Certificate Ceremony

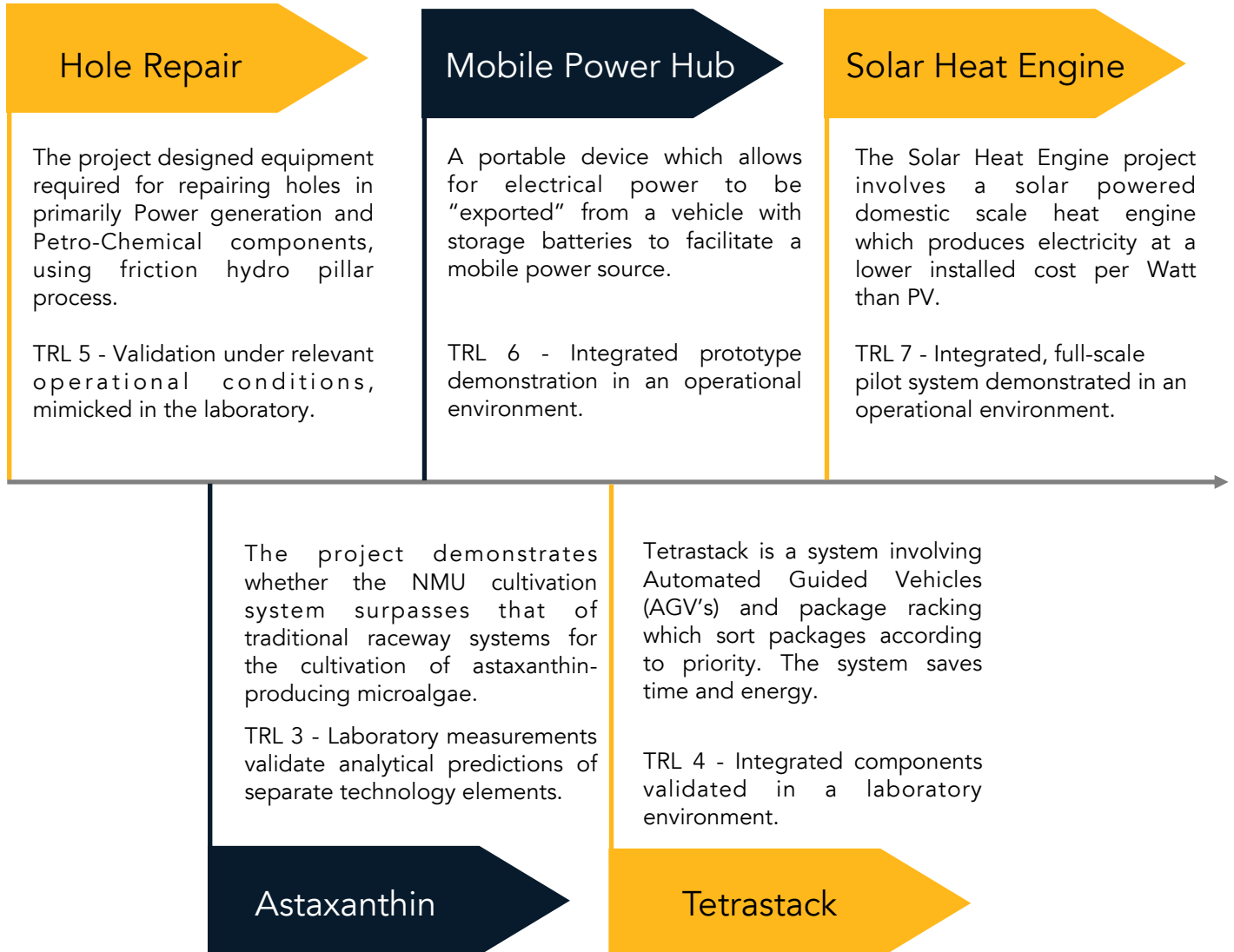
The Nelson Mandela University Innovation Office hosted a certificate ceremony on 4 June 2018 - in collaboration with Konica Minolta South Africa - to congratulate the teams who participated in the Konica Minolta International University Contest. Team AskIT earned a shared second place with a team from Wits; Team Phormentor won third place. The students were tasked with proposing an innovative alternative that delivers improvements for the institution.

The contest was a unique opportunity for the students involved to engage in an international cooperation project between the worlds of academia and business. The winners of the contest, from the University of Cape Town, were given the opportunity to represent South Africa in Amsterdam.



TIA Seed Fund close-out projects

The following TIA Seed Fund projects closed out during 2018.



TIA funding schemes

Seed Fund Programme - Assists HEIs, SCs and SMMEs to advance their research outputs and ideas to develop prototypes, proof of concept and business cases that could be used for further development.

[Read more](#)

Youth Technology Innovation - Designed to assist young innovators to access risk funding, mentorship and business skills support.

[Read more](#)

Innovation Skills Development - Provides focused and targeted training interventions to strengthen entrepreneurial capacity of researchers and innovators towards the commercialisation of their research outputs.

[Read more](#)

Technology Platforms - Designed to fund and support the establishment and operations of technology platforms that facilitate access to key infrastructure and expertise for technology innovation in targeted technology areas.

[Read more](#)

Technology Innovation Cluster Programme - Aims to fund technology development by facilitating an enabling environment for the advancement of technology innovation and commercialisation by adopting a value chain approach and catalysing collaborations amongst value chain players.

[Read more](#)

Global Cleantech Innovation Programme - The GCIP-SA is part of a global initiative aimed at promoting clean technology innovation and supporting entrepreneurs in growing their SMMEs and start-ups into viable, investment-ready businesses.

[Read more](#)

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