

Innovation Office

# News



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The Innovation Office gratefully acknowledges the funding support and guidance received from the Technology Innovation Agency ([TIA](#)) and the National Intellectual Property Management Office ([NIPMO](#)).

# Director's Note

2017 was a renewed challenge for the Innovation Office with both Jaci and Naazlene leaving to explore career and life opportunities elsewhere – taking their institutional memory and technical expertise with them.

The overstretched [team](#) that remains has managed to press on steadily and the process of compiling this newsletter has given us a welcome chance to reflect on the numerous activities that constitute the blur of the past year.

We trust that you will enjoy this selection of highlights.

A sincere thank you to the colleagues and stakeholders who have assisted us over this rather strained while - your continued support make these accomplishments possible.

Our attention of late has been on closing off the necessary so that 2018 can bring about a renewed focus on commercialisation activities. Here's to the pending recruitment of key staff to drive this agenda forward!

Onwards....

*Leonié*

*Acting Director: Innovation Office*



**2017  
at a glance**

**25**

Disclosures

**3**

Provisional patent applications filed

**3**

PCT applications filed

**5**

National phase applications granted

**164**

Research contracts supported

## SARIMA Conference 2017

Naazlene Patel (ex Innovation Manager) won the [DST/SARIMA](#) Award for Early Career Excellence in Innovation Management at the SARIMA gala dinner held in May 2017.

Presented by the Deputy Director General of DST, Mr Mmboneni Muofhe, the award recognises newcomers to the Research Management or Innovation Management profession in Southern Africa and highlights the significant contribution made to their institutions and country.

Jaci Barnett (ex Director) was appointed as the President of SARIMA at the same event. This followed her election as President-Elect in 2015 after a number of years as Vice President: Innovation and Technology Transfer, and more than a decade on the SARIMA Committee.

This was a bitter-sweet moment as Jaci moved to the UK in June. She will continue the role virtually until the current President-Elect takes over as President.



Naazlene receiving the award from Mr Muofhe (right) and Dr. José Jacon-Malete (outgoing SARIMA President - left).

# Innovation Office Staff

## Appointments



**Esethu Mdanyana** was appointed as Projects and Administrative Intern in January 2017, initially focusing on two of the office's external projects. Having attended [WIPO](#) Summer School in Cape Town during December 2017, she now assists with Innovation Office TIA Seed Fund projects and IP administration.



**Jessica Preston** was appointed as Public Relations and Marketing Intern in December 2017 as part of her Bachelor of Arts in Marketing and Corporate Communication studies.

## Farewells



**Jaci Barnett** left the Innovation Office at the end of May 2017. She joined the Nelson Mandela University in 2007 where she established the Innovation Office. Jaci is currently Senior Investment and Commercialisation Manager at the University of Bristol's Research and Enterprise Development Department.



**Naazlene Patel** left the Innovation Office at the end of September 2017 to further her career as a Commercialisation Specialist at Innovation Hub, Pretoria. She joined the office in April 2014 as the Intellectual Property Administrator and managed the TIA Seed Fund project portfolio during 2017.



**Elzaan le Roux** left the Innovation Office in December 2017. She joined the office in 2015 to complete her in-service training for her Diploma in Public Relations Management and her BTech degree in 2016. She remained with the office to assist with Innovation Bridge and the training of Interns in 2017.



**Teboho (Tebo) Mabeba** left the Innovation Office in December 2017. She joined the office in May 2017 to complete her in-service training for her Diploma in Public Relations Management. She was awarded a SETA internship during her placement in the office.



**Isaiah Gxekwa** left the Innovation Office in December 2017. He joined the office as Projects and IP Administrator in March 2017.



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## Projects

The Innovation Office assists researchers with projects across the research and innovation chain - from funding to negotiating contracts and commercialisation.

# Combatting scarcity of computing skills with Tanks

[Tanks](#) powered by Tangibl, is an inexpensive tool that aims to encourage the development of computing knowledge from a young age.

The mobile application (app), designed by postgraduate student Byron Batteson, teaches basic computer programming principles in a competitive, yet playful and exciting manner. Designed for pupils between the ages of 10 and 14, the app consists of a military tank that moves through a maze, following directions provided by physical tokens that form a puzzle.

The game has 20 levels which perform simple sequences of moving forwards, backwards, left and right. As the levels become more complex, the puzzle pieces allow the tank to move around or shoot down obstacles.

Tanks is actively striving to prompt scholars to consider computing as a career choice. Although the app is aimed at workshops for schools, it has good potential for commercial exploitation and has already received international interest.



Nelson Mandela University first year Programming students being introduced to coding by playing with Tanks.

# Growing-up: Children Building Careers™ (GCBC)



GCBC is a computer-based career development learning program that focuses on assisting learners in achieving the right mindset to make suitable career choices for their future.

GCBC addresses the need for career education platforms that effectively assist pre-adolescent children to develop age-appropriate skills, knowledge and the attitude required to make fitting future career choices.

The program was developed and successfully tested in two fieldwork trials as part of a doctoral study and exposes children to a wide variety of careers at a young age. It is currently being tested on the Nelson Mandela University server.

# Ncediso™ upskills health care workers

Ncediso™ is an integrated mobile app developed by the University's Centre for Community Technologies (CCT) that aims to upskill health care workers - including nurses and clinic practitioners - in areas where basic health care, first aid skills and clinics are scarce.

The app allows for the early detection of various disabilities and diseases among children and will be integrated into the Department of Health's existing solutions to allow ease of detection, monitoring and evaluation. The ultimate goal is to implement a set of technological tools that can enable the improved quality of life for citizens where healthcare facilities and skills are scarce.



Ncediso™ is available to users through Google Play Store in all African countries.

## Local AIDS drugs developed

The Innovation Office works closely with Prof. Paul Watts and his continuous flow technology manufacture of Active Pharmaceutical Ingredients (APIs). The Watts research group has developed and patented processes for the preparation of three AIDS drugs, namely: Emtricitabine, Lamivudine and Efavirenz.

The critical need for the local manufacture of APIs in South Africa has become evident. As a result, not only are other AIDS drugs being investigated, research is also underway to prepare drugs for cancer, malaria and tuberculosis. The vision is for more access to lower cost drugs, which will enable more patients to receive treatment.

Discussions are in progress regarding the establishment of commercial manufacturing facilities to exploit this technology in South Africa - the ultimate goal being to supply drugs for Sub-Saharan Africa.

Through Prof. Watts's work, Nelson Mandela University is also a partner in the Gates Foundation funded project, Medicines-for-All.



Microreactor set up for flow synthesis of Emtricitabine.

# Turbine design provides higher yield

Prof. Russell Phillips is the innovator behind a unique turbine blade arrangement that results in a fluid-driven turbine. This is most useful for low scale wind power generation applications.

The segmented blade arrangement increases the daily power yield from wind turbines operating in the turbulent wind conditions typical of low level urban installations. The turbine is expected to produce higher annual energy yields compared to the existing small wind turbines offered by competitors.

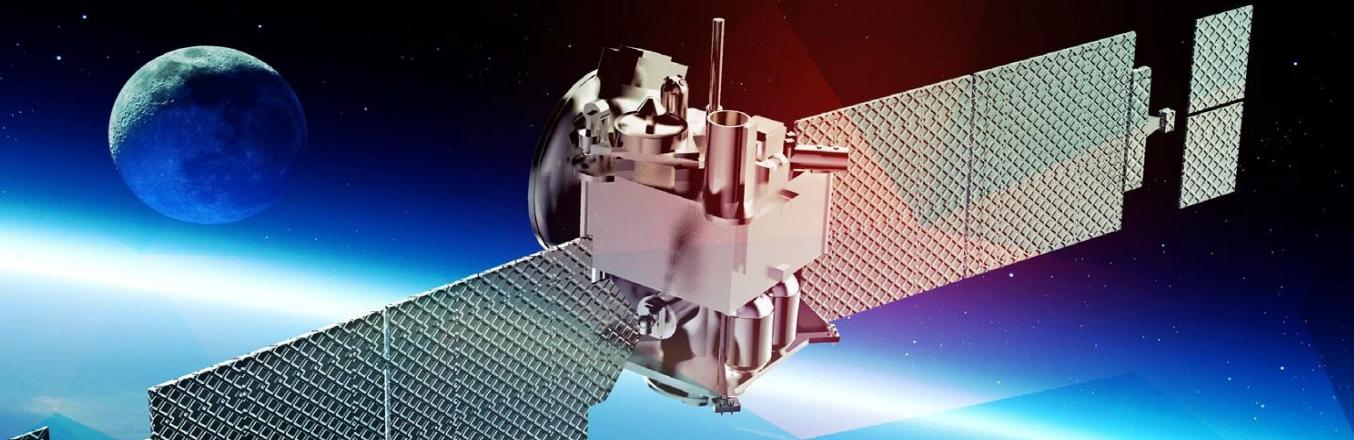
The primary purpose of the product is to enable every person to benefit from an affordable, convenient energy solution. To this end, the cost-effective manufacture of the blades has been the focus during 2017.

CNC-machined aluminium moulds, together with a high speed composite manufacturing process, aim to produce blades within 20 minutes.

The Innovation Office has initiated discussions regarding the installation of a pre-commercialisation prototype at [Propella](#) Business Incubator during 2018.



# University technology in space



Prof. Farouk Smith is the inventor behind the Nelson Mandela University's patented Radiation Mitigation VHDL Coding Technique that is currently being tested in space.

South Africa's first privately owned nanosatellite, nSight1, has been successfully sent into orbit from the International Space Station (ISS).

nSight1 was one of 28 nanosatellites from 23 different countries that launched for the ISS during April 2017. The nanosatellites were successfully deployed into a 400km low-Earth orbit on 25 May 2017.

The nSight1 project is a joint investment by Cape Town engineering consultancy, SCS Aerospace Group; and Pretoria software designers, Pinkmatter Solutions. Working with engineers from the Space Advisory Company, the South African team designed, integrated and tested the satellite in conjunction with contributions from Prof. Smith and scientists from the Cape Peninsula University of Technology.

Data collected from this experiment will aid current atmospheric models vital for determining safe re-entry trajectories for spacecraft. The same data can also be used for environmental studies.

# Reaping the benefits of an electric vehicle

Trevor Stroud and Prof. Peter Freere's Renewable Energy Agricultural Platform ([REAPER](#)) project aims to develop a suitable materials handling electric vehicle platform that can be adapted to various processes in the mining and agriculture sectors.

Active pneumatic suspension sets the vehicle apart from competitors, providing class leading all-terrain ability on a dynamically stable platform. Additionally, a matching photovoltaic charging station will provide a solar charging capability with swappable battery packs.

REAPER has been developed with input from the Sundays River Citrus Company (SRCC) and the project's initial focus is on improving productivity and reducing the costs associated with harvesting, cleaning, sorting, boxing and storing of fruit at the SRCC and associated farms.

The REAPER vehicle performed the first road test under its own power in November 2017 and has since made a number of low speed test runs.

Future plans for REAPER include the development of AGV [Automated Guided Vehicle] capabilities for outdoor use which will enable the vehicle to perform basic tasks autonomously in the orchards or at the packing house.



## Electrical vehicles as power sources

Mr Hiten Parmar is in the process of developing a mobile power hub prototype for hybrid and electrical vehicles to be used as power sources for household or small industrial equipment in the event of power outages.

The electrical power will be exported from the vehicles via storage batteries to facilitate mobility. Existing options for power export from alternative energy vehicles are limited, large and fixed.

The mobile power hub will enable electrical power to be exported at any location and is being co-funded and co-developed by the renowned power electronics company Microcare.

The prototype will be developed by combining the required CHAdeMO implementation protocol for electric vehicles with Microcare's technical expertise and components.

## University acknowledges innovators

The Nelson Mandela University acknowledged the outstanding achievements of top academics in research, innovation and engagement (among other categories) at the 2017 Research, Teaching and Engagement Awards.

The Innovation Office is proud to be associated with these worthy award winners.



**Innovation Excellence Award**  
Prof Darelle van Greunen



**Innovation Excellence Project Award**  
Controls and Automation Team:  
EDM Project



**Emerging Innovation Excellence Award**  
Mr Jean-Pierre Basson

## Low Smoke Fuel (LSF)

The aim of the LSF project was to develop a low-emission solid fuel with identical characteristics as coal but without the negative pollution aspects. LSF is primarily intended as a replacement fuel for the household use of coal and wood.



## Biological Fertiliser

Microalgae are known to be very effective in stimulating microbial activity in soil, and some species with high nitrogen levels offer the potential to redefine soil fertilization practices completely. The aim of this project is to produce fertiliser through the use of the microalgae culture being cultivated at [InnoVenton/DCTS](#).

The use of commercial fertilizers for food production is essential in order to produce the quantities of food required by the world's

Use of LSF could alleviate certain detrimental social impacts, such as the ill health and accidental death caused by CO<sub>2</sub> poisoning. The product has been branded *Ivuthakahle*, meaning "it burns well". It is efficient, cost-effective and suitable for both indoor and outdoor use. Tests have indicated that it burns 50% longer than coal and wood on average.

Various promotional demonstrations were conducted at shopping malls in Port Elizabeth during 2017 and resulted in positive customer feedback.

population. However, current practices have numerous unintended consequences, particularly in cases of over-application to increase crop yields.

The over-application of fertilizers leads to soil sterilization, which in turn results in poor nutrient accumulation by crops. Excess nutrients then leach from cultivated lands into water bodies, resulting in the enrichment of natural water reservoirs.

## Olive Cosmetics

Dr. Nicole Vorster, and her PhD student, Marthie Postma-Botha, have extracted bioactive compounds from olive pomace, the semi-solid waste of olives.

Although the products have yet to be commercialised, the development has progressed to the stage where stable cosmetic products containing these extracts have been formulated. The extracts used in the products are obtained from waste material containing more antioxidants than found in olive oil itself.

Research has shown the presence of bioactive compounds in the olive pomace that would stimulate factors such as moisturisation, anti-ageing, anti-bacterial and UV-protection in the cosmetic products. A PCT application for this formulation was filed in November 2017.



## In memory of Prof. Ben Zeelie



The Innovation Office would again like to acknowledge innovator and inventor, Prof. Ben Zeelie, who passed away in April 2017.

Prof. Zeelie made significant contributions to the innovation space and the Intellectual Property portfolio of the University. He is sorely missed.

# National Science Week (NSW)

Nelson Mandela University had the privilege of hosting the official launch of NSW - themed "Advancing Science Tourism" - at its Missionvale Campus on 4 and 5 August 2017.

NSW is a DST initiative to create awareness around science, technology and innovation. It provides a platform that makes science and technology accessible to the public. NSW aims to popularise science and encourages learners to take up the subject in school.

With over 100 regional and national exhibitors, the Innovation Office partnered with TIA to showcase the following TIA-funded innovations:

- Media Player for the Blind – a portable media player adapted to allow ease of use for the visually impaired.
- GCBC (p. 3)
- Ncediso™ (p. 4)
- Qbell™ (p.11)



Tebo posing with TIA representatives at the NSW stand.

## Innovation Bridge

The Innovation Office attended [Innovation Bridge](#), a technology matchmaking and showcasing event held in September 2017 at the Gallagher Convention Centre in Midrand.

This DST initiative aims to facilitate linkages and networking between South African and international innovators, industry, technology development and commercialisation funding partners.

The Innovation Office staff exhibited a number of [technologies](#) which are currently at, or approaching, market-ready stage.

The Innovation Office would like to thank TIA for providing our office with the resources to attend the 2017 Innovation Bridge.



Melanie Leitch (Contracts Lawyer) discussing Low Smoke Fuel with Innovation Bridge delegates.

### Projects exhibited:

- Concentrator Photovoltaic
- Growing-up: Children Building Careers™ (p. 3)
- High Yield Turbine (p. 5)
- HiStart
- Low Smoke Fuel (p. 7)
- Media Player for the Blind
- Microalgae to Energy
- Olive Waste (p. 7)
- Soft Contact Lenses
- Solar Heat Engine
- Space Radiation (p. 5)

# World IP Day

World Intellectual Property Day is an initiative of the World Intellectual Property Organisation (WIPO) aimed at highlighting the role that IP rights play in encouraging innovation.

In celebration of this annual event, the Innovation Office held a series of IP talks with several departments during April and May 2017.

These sessions provided postgraduate students with an overview of IP rights (patents, trademarks, industrial designs, copyright) and the various protection options associated with those rights.

The Innovation Office also hosted a competition around the year's 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 smartphone projector, was Zinjan Boukes, a Masters student in the Department of Sociology and Anthropology. Zinjan proposed the development of an app that could be utilised by the South African National Blood Service and potential blood donors.



Zinjan receiving his award from Naazlene.

## Student Entrepreneurship Week (#SEW2017)



In celebration of "Entrepreneurship as a Career" for #SEW2017, Enactus, the Innovation Office and [Propella](#) Business Incubator hosted a lunch hour information and awareness session in August.

The Innovation Office presented key information on IP protection and the session provided attendees with an overview of the contributions that the Innovation Office and Propella make within their respective roles in the innovation and entrepreneurial ecosystem.

Propella Incubatee, [Tuse](#) - who makes communication technology available in places with no signal through wireless mesh networks - elaborated on their entrepreneurial journey and the impact that the support from Propella has on startups in Nelson Mandela Bay.

## Student attends SA Innovation Summit

BA (Hons) Psychology student, Zintle Sigwabe, was invited to attend the South African Innovation Summit - held in Cape Town during September 2017 - to showcase her community project idea *Liqhame Liqaqambe Ikamva* [Ignite and shine for a brighter future].

*Liqhame Liqaqambe Ikamva* is a therapy hub which offers skills development and counselling for the community and aims to create awareness in youth, promote good mental health and decrease environmental issues.

The Innovation Summit is an annual flagship event that provides a platform to nurture, develop and showcase African innovation, while facilitating thought leadership and collaboration.



The Innovation Office contributed towards Zintle's cost to attend the Summit and wishes her well with the hub becoming a reality.

## International Collaboration

# Entrepreneurship, Modernization and Innovation in SA (EMISHA)

Nelson Mandela University's Innovation Office was a partner in the international [EMISHA](#) project - a two-year collaboration between technology transfer offices at Cape Peninsula University of Technology, the Universities of Fort Hare, Free State, Zululand, Western Cape, Edinburgh, Uppsala and Valladolid.

EMISHA aimed to promote knowledge exchange in the areas of innovation management, entrepreneurship and incubation and the project - funded by the European Union's Erasmus+ Programme - ended in November 2017.



The EMISHA team in Edinburgh.

Leoné attended two EMISHA-funded project workshops during the year: a two-day session on social innovation held in Cape Town during August, and the final workshop week - focused on Industry Relations - shared between Edinburgh Innovations and Uppsala University in September 2017.

Naazlene attended the Edinburgh Innovations session, then proceeded to visit the University of Bristol's Department of Research and Enterprise - funded in part by the DST / SARIMA Award for Early Career Excellence in Innovation Management that she received at the SARIMA Conference in May 2017.

“

Our involvement in the EMISHA project has enabled us to better serve our innovation and entrepreneurial ecosystem, in line with global technology transfer best practice, while expanding our network of international peers for future collaboration. - **Leoné**

”

## EMISHA provides equipment support

Nelson Mandela Bay innovators were boosted with access to CNC technology funded by the international EMISHA collaboration.

The CNC equipment is housed at Propella to allow access by incubatees, as well as Nelson Mandela University staff and students.

The EMISHA project partner allowance also enabled the Innovation Office to purchase various items of support equipment and re-branded marketing material after the University was officially renamed during July 2017.

Once again, we express our sincere gratitude to the EU for the support received via the EMISHA project.



With the new Stepcraft CNC machine are (left to right): Robert Bosch (RNP), Anita Palmer (Business Incubator Manager) and Leoné Nowell (Acting Director, Innovation Office).

# Propella Business Incubator

Propella began as a partnership between the Nelson Mandela University, the Industrial Development Corporation and the private sector in 2015.

In 2017 Propella repositioned itself as a "smart" incubator and accelerator and revised their business model to serve the interests of individual entrepreneurs, while striving to address the challenges faced in Nelson Mandela Bay. Propella's key focus areas are ICT, renewable energy, energy efficiency, smart city solutions and advanced manufacturing.

Not only does the incubator provide startups with access to markets, technical support, finance, business support and mentorship; Propella assists incubatees with funding applications and capital raising efforts.

The Innovation Office continues to work closely with Propella in growing the region's innovation ecosystem.

## Innovolve<sup>1</sup> innovations at Propella: QSystems

Heinrich Williams, owner of the startup company QSystems SA (PTY) Ltd, has been focusing on the development of products Qbell™ and QPark this past year to ensure that they are ready for commercialisation trials in 2018.

Qbell™ is a nurse call button that enables individuals with limited or no motor function to alert a nurse. A full production model has been manufactured during the past year, assisted by [eNtsa](#).

The lack of designated parking bays for persons with disabilities is an increasing national problem. QSystems has developed an innovative parking system solution for registered users called QPark.

QPark 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 system will enable registered members to use any QPark parking space countrywide and will be tested at various shopping malls around Port Elizabeth as a pre-commercialisation pilot during 2018.



## Rubber Nano Products (RNP)

RNP began with a single flagship product that is now approved and in use on a small scale globally.



The product offering of RNP is maturing into distinctive products for the various segments of the rubber industry whilst the activator technology has been demonstrated to be suitable and attractive for tyre manufacturers in terms of production and performance.

RNP is constantly growing their local presence while pursuing global tyre and rubber company opportunities.

<sup>1</sup> Innovolve (Pty) Ltd is Nelson Mandela University's commercialisation company.

**2017**  
at a glance

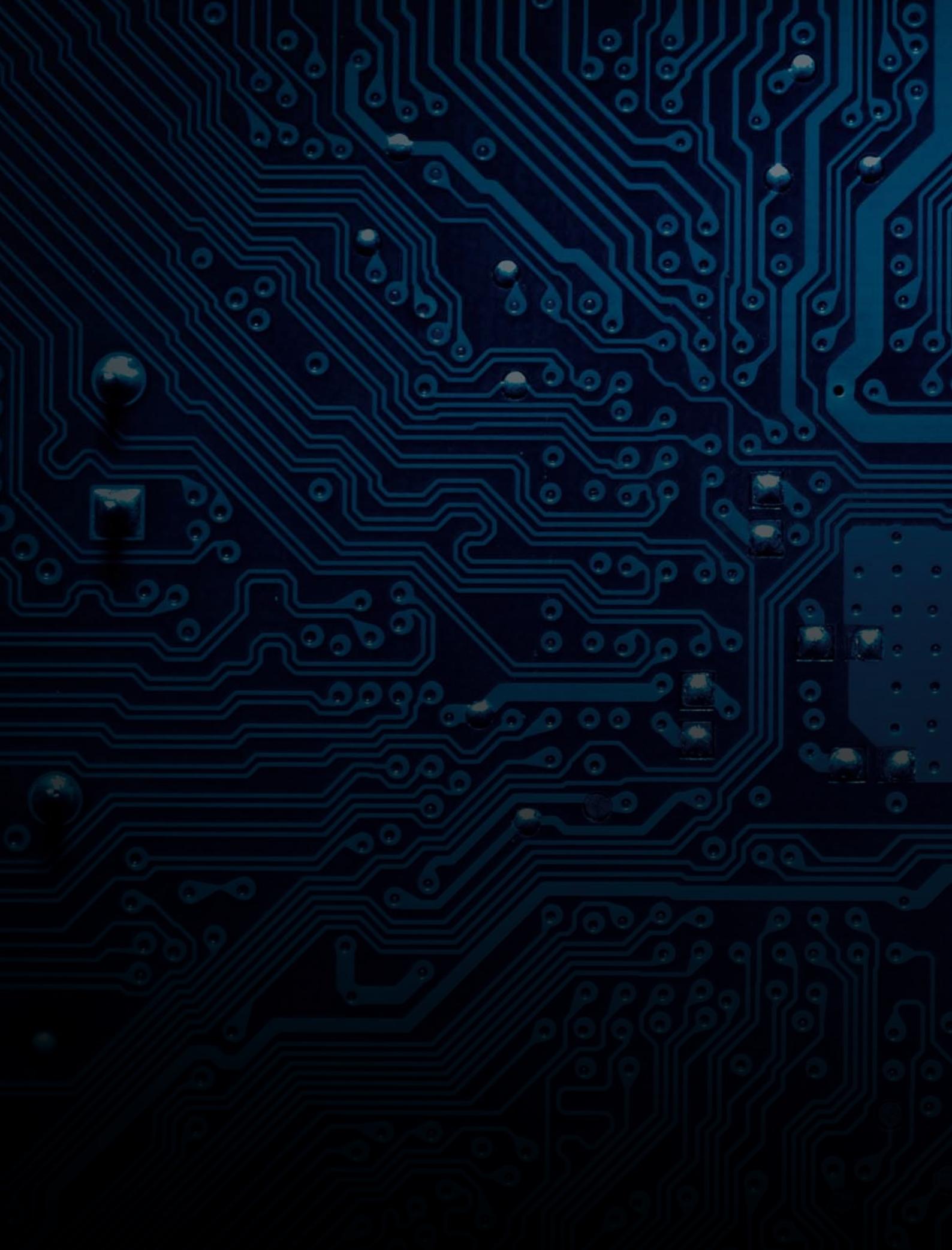
**96**  
Applications received and processed

**16**  
Physical incubatees

**11**  
Virtual incubatees

**16**  
Workshops held

**1142**  
People trained



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