

## AN INCUBATOR OF IDEAS

UP has the highest number of patents<sup>1</sup>, proving that our research makes a meaningful contribution to South Africa, Africa and the world.

192

New inventions disclosed<sup>2</sup>

167

International patents filed<sup>2</sup>

## INNOVATIVE AND FORWARD-LOOKING

Ranked #1 in South Africa (and #91 in the world) for SDG 9: Industry, Innovation and Infrastructure.<sup>3</sup>

UP is also the only South African university ranked in the 2023 World University Rankings for Innovation.

## WE MAKE TODAY MATTER

We ensure the knowledge and solutions we discover are both relevant today, and robust enough to have a lasting, positive impact on our world.

It is a reminder that, within every day, lies the potential to change the world.

## DOING RESEARCH THAT MATTERS

UP is ranked first in Africa for Environmental Impact (#139 globally) and third in Africa for Social Impact (#161 globally)<sup>4</sup>. A small sample of recent research confirms the impact our research has on society.

- Undertaking cancer research using human hormones as a possible cure for cancer
- Producing nanobodies to speed up the testing and treating of COVID-19 patients, using antibodies from the Camelidae family
- Creating customised and personalised 3D modelled cochlear implants for patients with profound hearing loss
- Using gene editing of plants as a new form of pest control
- Patenting the use graphene as a wool to revolutionise various industries, leading to a cleaner future
- Researching new kinds of leadership needed to ensure sustainable futures
- Redesigning aeroplanes to be cleaner, faster and cheaper using albatross flying techniques
- Creating modern foods from Africa's indigenous crops
- Revealing southern Africa as the birthplace of modern Homo sapiens.

Source:

1. 2020 submission to the Department of Higher Education and Training
2. For the years 2013-2023
3. 2023 THE Impact Rankings
4. 2022 QS Sustainability Rankings

## FUTURE-FOCUSED

We are developing future innovators through a number of projects and partnerships.

**African Global University Project** – projecting African knowledge perspectives to the world

**Alliance for African Partnership** – collaborating for sustainable futures for all

**TuksNovation** – a high-tech business incubator available to all UP students

**The Digital Capability Laboratory** – employing digital collaborative learning to develop future-fit programmes

**United Nations Children's Emergency Fund** – supporting learners to make a successful transition to higher education through digital learning.

## UNIVERSITY OF PRETORIA WHERE IDEAS TAKE FLIGHT

2023

### Innovation knows no boundaries.

It stretches beyond disciplines and geographical borders. It unlocks the safety gate of traditional thinking. It's a state where new futures are being designed.

If innovation is the logical outcome of the search for answers, the University of Pretoria produces a world of answers, answers that help create sustainable futures for South Africa, Africa and the world.



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

Make today matter

[www.up.ac.za](http://www.up.ac.za)



# HELLO, AI

We're helping to design new futures with the research we do today.

**3** Mobile robots on staff:  
**Stevie**  
A telemedicine mobile robot that helps treat intensive care unit patients

**Libby**  
A library client-service robot

**smWoef**  
A robot dog that collects data in hard-to-reach and at-risk locations

**5** Research chairs focus on 4IR technologies and data integration to proactively solve current and future problems



# GLOBAL LEADER IN IMPACTFUL RESEARCH

As a member of the Worldwide Universities Network – a network of 24 leading research universities on six continents – UP is recognised as a valued research partner. Here's why:

- Rated in the top 1% in 14 of 22 ESI knowledge fields
- Collaborates with over 3 000 institutions across the globe and has around 230 international institution-wide partnerships across 70 countries and six continents
- About 44% of the research we conduct is done with international collaborators
- Mineral and Mining Engineering is ranked #35 in the world<sup>5</sup>

Source: 5. 2023 QS World Rankings by Subject

# Working hand in hand with AI

**Makerspace**  
First university in SA to have a “makerspace”, a creative laboratory where students can create prototypes and test ideas using 3D printing and IoT technologies

**RapidAI**  
Steve Biko Academic Hospital (SBAH) is the first hospital in Africa to implement an artificial intelligence tool to assess the brain tissue in stroke patients

**RIPper**  
FABI has developed a bioinformatic software tool that allows scientists to unravel important evolutionary implications for deadly fungi that threaten biodiversity and agriculture

# Some of the world-first technologies created at UP

**dbTrack** – measures sound exposure in a person's ear canal, with smartphone feedback

**Masakhane** – a machine learning tool that translates regional languages in Africa not represented in technology

**Craniofacial reconstruction**  
– a computer program to recreate facial features and speed up identification of victims, reconstruct faces after surgery and help feedlot producers with precision feeding



# THE SPACE TO IMAGINE

We have state-of-the-art facilities and we drive digital leadership.

**80+** Research Institutes and Centres

**51** Research chairs hosted across seven faculties

**8** Transdisciplinary research and innovation hubs generate new knowledge, helping to solve some of the world's toughest challenges

**FABI**  
World-renowned for developing novel food and fibre crops

**Innovation Africa@UP**  
Where smart and precision agriculture ensures food security

**Centre for Human Rights**  
Advancing human rights through education, research and advocacy

**UP Institute for Malaria Control**  
Longest standing transdisciplinary research initiative at UP

**Javett-UP Art Centre**  
Introducing the Arts of Africa to the world, and enhancing transdisciplinary learning through the arts

**Engineering 4.0**  
Research and training hub for smart transport systems and smart cities

**Future Africa**  
Transforming the world through African research excellence

**Centre for the Future of Work**  
Preparing people and organisations for the future.



# PIONEERS ON THE AFRICAN CONTINENT

As a leading African university, UP plays host to a number of innovative platforms to ensure Africa achieves sustainable and inclusive development.

- World's leading laboratory in DNA typing of rhinoceros
- First WHO Collaborating Centre in Africa (for the prevention of deafness and hearing loss)
- Africa's lead laboratory in malaria control
- Africa's first independent transport reference and testing facility
- Africa's first Virtual Reality Centre for mine design
- First university in Africa to sign an agreement with Cornell University, to collaborate on research focusing on sustainability
- Only university in Africa to belong to the University Social Responsibility Network, which has 16 members from across the world
- Hosts the leading Centre for Viral Zoonoses in Africa
- First portable emissions measurement system in Africa to help set realistic carbon emission targets
- Hosts one of two Centres for the Study of the United States in Africa
- Hosts the only Centre for Asian Studies in Africa.

