

Looking to the future

- 1. Introduction
- 2. Centre for the Advancement of Scholarship
- 3. Forestry and Agricultural Biotechnology Research Institute
- 4. Future Africa
- 5. Javett-UP Art Centre
- 6. Engineering 4.0
- 7. Unsettling Paradigms

1 | Introduction

This chapter brings together a number of research institutes, centres and hubs that offer academic spaces for transdisciplinary research at the University of Pretoria. They are by and large, research platforms that are not embedded in either departments or faculties within the University. They enjoy relative autonomy from the faculty structures, even though they keep some relationship with them. These include: the Forestry and Agricultural Biotechnology Institute (FABI), the Centre for the Advancement of Scholarship (CAS), the Future Africa Institute, the Javett-UP Art Centre, and Engineering 4.0. In a traditional sense, they are positioned as institutes or centres for advanced research, which are designated to create the environment for innovative scholarship with a focus on high-level research. However, these institutes and centres offer additional research platforms, which are often free from faculty or departmental constraints to engage in inter-, multi- and transdisciplinary research and international collaborations.

Although not all the entities covered in this chapter focus on independent research, those that do not — such as the Javett-UP Art Centre — offer the much-needed ancillary support to multiple research initiatives undertaken across the University. The Javett-UP Art Centre also provides a unique space for curating material and visual cultural expressions whose histories and scale offer a rich window into Africa's heritage and aesthetics. Also included in this chapter is a supra-institutional project that has brought together eight research-intensive universities in South Africa to advance scholarship in curriculum transformation. While not an institute or research centre, this far-reaching project was conceptualised in response to the social movement for transformation in the higher education landscape since 2015. The project, entitled 'Unsettling Paradigms: The Decolonial Turn in the Humanities Curriculum at Universities in South Africa,' has stimulated and strengthened work in the vital but under-researched field.

The Centre for the Advancement of Scholarship, Engineering 4.0, Future Africa and FABI, although unique, both in terms of their origins and research thrust, are nevertheless united in their singular goal to encourage collaborative and transdisciplinary research that is both cutting-edge and international. They are not only driven by high research impact in pushing the frontiers of knowledge, but equally by the need to bring about social impact and a closer engagement with different communities of practice, whose direct interface with multiple stakeholders is often ignored in the academy. They offer the space for intellectual dialogue, cross-disciplinary exchange of ideas, and a platform for collaborative research that is crafted around the new and challenging problems that society faces. In different terms, these research entities embrace the University of Pretoria's overarching vision of being a "leading research-intensive university in Africa, recognised internationally for its quality,

relevance and impact, and also for developing people, creating knowledge and making a difference locally and globally."

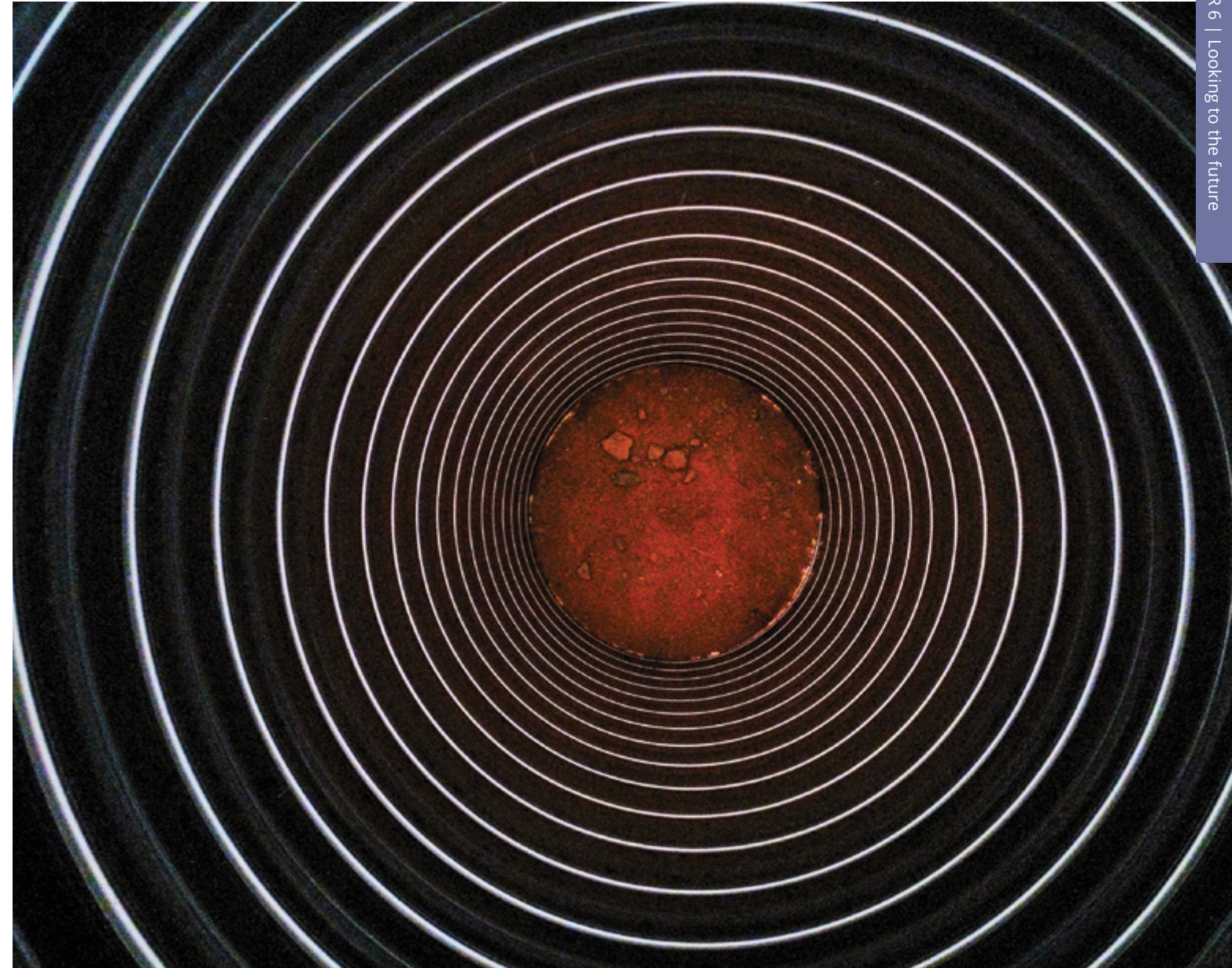
In order to realise their vision, these entities work to foster a multi- and transdisciplinary research environment, which is also aimed at training a new type of researcher who is adept at moving with an ever-changing research environment and the challenges facing our developing nations as they grapple to move out of the industrial revolution into the fourth industrial revolution. So much of the research provenance has to be post-disciplinary, adaptable and geared towards a rapidly transforming society, while globally engaged and networked. The work being undertaken at Engineering 4.0 is a good example of such research. Similarly, FABI, which has one of the longest histories in the kind of research referenced here, has perfected cutting-edge research with global footprints and provenance. Its work is locally situated while simultaneously benchmarked against some of the best research practices in the world. The Centre for the Advancement of Scholarship's range of transdisciplinary research initiatives and projects, and its extensive network of collaborative research beyond our national boundaries, is positioned as one of the most engaged research entities locally and internationally. Of significance for the centres at UP, is the work they are doing in the training of a new generation of scholars, both at postgraduate and postdoctoral levels.

The institutes and centres attract scholars way beyond our borders and therefore contribute in situating the University of Pretoria as an African university with a global reach and relevance. It is fair to argue that most of these entities, even those with a deep history extending into UP's past, thrived under the leadership of Prof Cheryl de la Rey. Indeed, the

new kids on the block — such as the CAS, Engineering 4.0, the Javett-UP Art Centre and Future Africa — were given their initial impetus by Prof De la Rey whose vision and desire for cutting-edge research undoubtedly became the driving force behind these unique entities. It is not surprising that her office raised the funding for the physical infrastructure of these entities and platforms that would become, in many ways, the face of a transformed UP and the place to go when convening

diverse intellectual voices in Gauteng and further afield. They are the envy of our competitors in the region and worth every cent invested in them. What follows are individual accounts of what these institutes and research hubs achieved during the tenure of Prof Cheryl de la Rey.

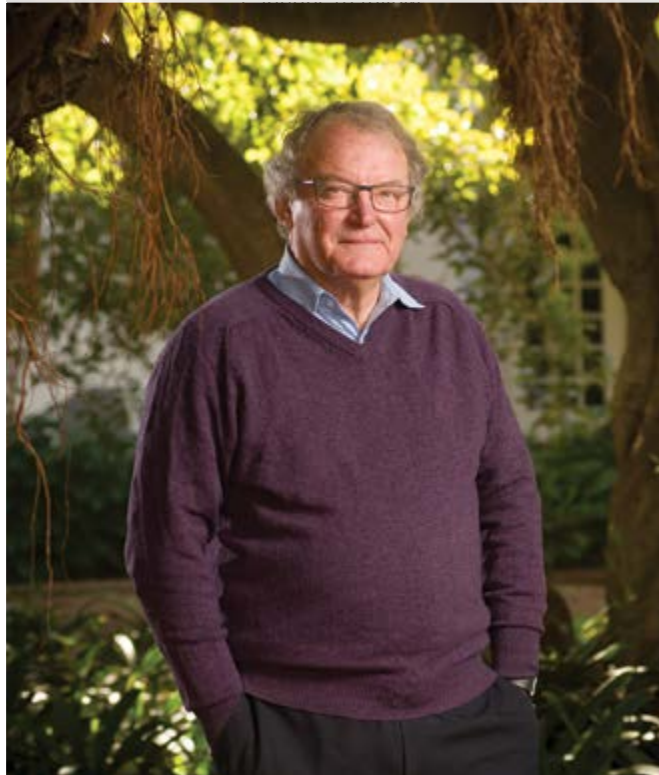
Prof James Ogude



2 | Centre for the Advancement of Scholarship

The [Centre for the Advancement of Scholarship \(CAS\)](#), at the University of Pretoria, was founded in 2013. The Centre was a major reconfiguration of the earlier Unit for Advanced Study that was established in January 1999, under the leadership of Prof Nico (N) Sauer. The aim then was for the Unit to play a role in fostering multidisciplinary research within the University and to provide an academic home for research fellows outside of faculties and departments.

Prof Robin Crewe, Director 2013–2017 | Prof James Ogude, Director 2017–



appointed as the first full-time director to manage this newly rebranded research entity, with a clear mandate to develop the criteria for the recruitment of fellows to the Centre. From 2015 until 2018, Prof Cheryl de la Rey served as the Chair of the Centre's Advisory Board and helped in shaping its vision, working closely with highly experienced founding board members like, Profs Njabulo (NS) Ndebele, Hendrik (HB) Geyer and Theo (DT) Goldberg, among others.

The mission of the Centre is to contribute to UP's overarching vision to be a leading research-intensive university in Africa. The Centre contributes to this by providing an environment where multi- and transdisciplinary scholarship can flourish. The Centre aims to provide a home for selected distinguished scholars to engage the University for short periods of time; to retain senior scholars so that they can continue their research activities and mentor postgraduate students and young academic staff; and to provide a physical home on campus for interaction between senior and visiting scholars, postdoctoral fellows and doctoral students.

While these foci remained relevant, a fundamental reorganisation of this Unit's vision and mission was needed to turn it into an important research hub in the University. This also entailed addressing some of its shortcomings, and providing it with a physical location on campus. In 2011, the Executive and the Senate approved a proposal to transform the Unit into the Centre for the Advancement of Scholarship and in 2012 funding was made available for the renovation of the Old College House, formerly used as the Student Affairs building, to become the physical location of the new Centre on the Hatfield Campus. In 2013, Prof Robin (RM) Crewe was



Centre staff with Prof De la Rey, November 2018

Prof Crewe was the driver behind the overhaul of the Centre and its repositioning locally and internationally. At its inception, the Centre consisted of Prof Crewe, three administrative support staff and a small group of senior research fellows; by 2014 the cohort of fellows had increased to seven senior research fellows. In 2018, the Centre had expanded to 10 senior research fellows, and had embarked on an aggressive postdoctoral fellowship recruitment, reflected in the growth of this group of researchers in later years at the Centre.

In 2017, Prof James (J) Ogude was appointed as the successor to Prof Crewe, and took over as Director of the Centre. He had previously served as Deputy Director since 2013.

Projects, publications and awards

Between 2009 and 2018, the Centre hosted a number of projects, with five projects reported in 2014. These most notably included, the Templeton World Charity Foundation (TWCF) funded project on 'The meaning and value of Ubuntu in human and social development in Africa', which was led by Prof Ogude. Other projects at the time included the Andrew W Mellon Foundation funded Human Economy programme, the Centre for the Study of Governance Innovation (GovInn), and the Capital Cities project.

Over the next five years, the Centre's projects expanded to include the African Observatory for Humanities for the Environment, the Agricultural Transformation in Africa (ATA) programme, and Peer-Learning for Emerging Researchers' Knowledge and Advancement (PERKA). At the end of 2018, the Centre was awarded funding by the Andrew W Mellon Foundation for a five-year supra-national project titled 'Entanglement, mobility and improvisation: Culture and arts in contemporary African urbanism and its hinterlands', in collaboration with the universities of Cape Town, Makerere and Ghana.

The projects at the Centre reflected its strategic vision to foster multi- and transdisciplinary research within the University, and to provide a space for dialogue and interaction of scholars across disciplines and generations. Since its founding in 2013, there has been a deliberate drive to encourage research in the broad areas of Humanities disciplines, evident in the range of Humanities focused projects hosted at the Centre. In 2018, the Humanities for the Environment programme became the signature project of the Centre, with the sole aim of fostering transdisciplinary research. The central theme of this signature project is 'The poetics and politics of extraction and the environment in Africa'.

The Centre produced 23 books, both edited volumes and authored manuscripts, 25 book chapters and 75 articles published in academic journals between 2014 and 2018. Most notably, in 2018/2019, the Centre had two edited volumes published as major outputs from the Ubuntu project, which included *Ubuntu and Personhood* (Africa World Press, 2018) edited by Prof James Ogude; and *Unfolding Narratives of*

Ubuntu in South Africa (Routledge, 2019) edited by Prof Julian (JC) Müller, Dr John (JLB) Eliastam and Dr Sheila (S) Trahar. In 2019, a further two edited books were published from this project. The Human Economy Programme published eight volumes in its Human Economy series overseen by Prof John (J) Sharp and Prof Keith (K) Hart.

Other major outputs in the review period at the Centre included the 2015 and 2017 publications by Prof Charles (C) van Onselen. In these two years, Prof Van Onselen authored two books to widespread acclaim: *Showdown at the Red Lion: The Life and Times of Jack McLoughlin, 1859-1910*, and *The Cowboy Capitalist: John Hays Hammond, the American West, and the Jameson Raid in South Africa* — both published by Jonathan Ball. In 2017, Prof Van Onselen was also awarded the Human Sciences Research Council (HSRC) Annual Medal in Social Sciences and Humanities, an award conferred annually on a scholar who has made an outstanding contribution to research in the Social Sciences and Humanities.



Launch of *The Dark Side of the Hive: The Evolution of the Imperfect Honey Bee* by Prof Robin Moritz and Prof Robin Crewe

In 2013, Prof Crewe was awarded the first and one of only two Gold Medals for Outstanding Meritorious Service from the Academy of Science of South Africa (ASSAf); and in 2015 two Centre books were awarded the Vice-Chancellor's Book Award for scholarly books, monographs or collections: Prof Lorenzo (L) Fioramonti was the recipient in the Humanities and Social Sciences category, for his book *Gross Domestic Problem: the politics behind the world's most powerful number* (Zed Books, 2013); and Prof Jan (J) Boeyens was the recipient in the Natural and Applied Science category for his book, *The Chemistry of Matter Waves* (Springer, 2014). In 2016 Prof Chabani (NC) Manganyi was recognised with the NRF Lifetime Achievement Award. In 2018, Prof Manganyi received the ASSAf biennial Humanities Book Award for his memoir, *Apartheid and the Making of a Black Psychologist: A Memoir* (Wits University Press, 2016).

Highlights of events and people

The Centre also hosted a number of significant events in this period. In November 2013, the Centre hosted an event titled 'Celebrating the legacy of Chinua Achebe: A critical reflection on Achebe's contribution to Africa's literary landscape', which also served as the launch of the Centre. The keynote was given by the late Mbulelo (MV) Mzamane, one of South Africa's foremost writers and scholars of African letters.

The Centre has had two of its senior research fellows invited to present at the University's Expert Lecture Series. In 2014, Prof Ogude presented on the topic 'Great expectations and the mourning after: A literary anatomy of post-independence politics in Africa'; and in 2016 Prof van Onselen presented on the topic 'Sunny places for shady characters: The making of work class cultures in southern Africa's mining revolution, c1886-1914'.

Within the Ubuntu project, from 2013 until 2017, the Centre hosted a number of colloquia with guest presenters such as DA Masolo, one of Africa's foremost philosophers based at the University of Louisville, Kentucky (US) and an authority on self

and community in Africa; and South African poet and writer, Wally (MW) Serote. In 2016, under the banner of the Ubuntu project, the Centre started the production of *Mama Mudu's Children*, directed by Masitha (M) Hoeane, which performed at the Aula and the Soweto Theatre, to full capacity audiences.

The Centre has hosted a number of visiting professors over the years who have presented seminars at the Centre. These include, Dr Geoffrey (G) Harpham, Director of the National Humanities Centre, North Carolina (US); Prof Akosua Adomako (AA) Ampofo, president of the African Studies Association of Africa (Ghana); Prof Eileen (E) Julien, a professor of Comparative Literature, French and Italian Studies in the College of Arts and Sciences at Indiana University, Bloomington (US); and Prof Joni (J) Adamson, Director of the Environmental Humanities Initiative (EHI) at Arizona State University (US).

Conclusion

Since its inception, the Centre has focused on establishing research projects and growing its multi- and transdisciplinary focus. In the five years under the purview of Prof Cheryl de la Rey, and thanks to her unwavering support, the Centre developed a critical mass of researchers and projects to extend its focus into Humanities disciplines, per its mandate. The Centre also developed a strategy to foster meaningful, high-quality transdisciplinary research and a platform for the recruitment and mentoring of postdoctoral fellows. It has endeavoured to become a hub for projects that respond to societal issues, while equally extending its academic networks internationally, as was recently noted by the external review panel of the Centre. The Centre continues to grow and expand, working in conjunction with other like-minded entities at the University of Pretoria, such as Future Africa, the Javett-UP Art Centre, and some faculties at UP, to further multi- and transdisciplinary research, in an effort to enhance the research vision and international profile of the University, especially in the development of early career scholars and creating global linkages in Africa and beyond.

3 | Forestry and Agricultural Biotechnology Research Institute

The *Forestry and Agricultural Biotechnology Research Institute* (FABI) was established as a stand-alone postgraduate research institute at the University of Pretoria in 1998.

The overarching aim of the Institute was to drive transdisciplinary research across the broad plant-based biological sciences, mainly residing in the Faculty of Natural and Agricultural Sciences (NAS). This focus was also strongly linked to the rapidly emerging and powerful recombinant DNA technologies that were significantly shaping research depth and excellence across all spheres of biology. During its first 12 years of existence and thus up to 2009, FABI had rapidly established itself as one of the foremost research units at the University, having a substantial international footprint for excellence in the broad plant sciences.



The foundation that provided for the establishment of FABI was a programme established at the University of the Free State (UFS) in 1990, known as the Tree Pathology Co-operative Programme (TPCP). The TPCP team, comprised of five academic researchers and approximately 50 postgraduate students, moved to the University of Pretoria in 1998, providing the catalyst for the establishment of FABI. An immediate goal was to expand the focus of the research and education project to include the broader agricultural sector, while also fortifying the forest tree health programme. By 2009, substantial progress had been made towards this goal, having, by that time, established research programmes focused on the banana industry, the avocado industry, grains research and a significant programme dealing with the genetic improvement of trees important to the South African Forestry Industry.

During the 2009–2018 period, most of these areas were substantially expanded and grown. Exceptions were the banana research programme that was closed due to the

financial constraints of that industry, and the Centre for Applied Mycological Research, which had been established in a partnership with the Council for Scientific and Industrial Research (CSIR) and had not gained sufficient momentum to justify continuation. The research leaders of these two programmes, Prof Altus (A) Viljoen and Prof Gert (G) Marais respectively, had also chosen to move to other universities in South Africa.

A major point of growth for the tree health programme in FABI was to integrate an entomological component into the TPCP. This meant changing the name of the programme from Tree Pathology Co-operative Programme to the Tree PROTECTION Co-operative Programme. This major change came about due to the South African Forestry Industry's in-house research institute, the Institute for Commercial Forestry Research (ICFR), losing its capacity in entomology. The TPCP Board voted to integrate their research needs in forest pathology and forest entomology at FABI formally in 2003. This led to a very substantial growth in the TPCP from that point onwards, and specifically due to increasing insect pest problems affecting plantations in South Africa. The change was also consistent with the fact that insect pests and microbial pathogens commonly act together in affecting the health of trees. The integration of pathology and entomology research in the TPCP at FABI substantially increased the impact of the group internationally to become the world's largest single research programme working on the health of trees, particularly in planted forests.



Industry and government support for research

Understanding that external funding for research clearly defines the outcomes of any university research programme was and continued to be key to the growth and success of FABI. At the outset, the founder team of the Institute came to the University with substantial funding from the South African forestry industry, which included private companies as well as government. The government funding was broadly matched against private industry funds and the University provided salaries for the core academic staff and most of the physical facilities. This 'leverage' model was utilised as new industry and partners established research programmes in FABI, and continues today.

While university research depends on external funding for success, it is crucially important that the external funding agencies understand that research excellence must include long-term objectives that go beyond the short-term problem-solving that typifies operations research. Failure to achieve a clear balance in this regard means that research is inevitably local in nature and far from world-leading. FABI managed very effectively to achieve this balance in all its projects and this has defined its trajectory to world-leading research excellence, well-illustrated in all the key metrics that measure this objective. It has thus also led to large numbers of postgraduate students joining the Institute from many different countries. It has likewise initiated global collaborations with groups from many different regions in the world.

During the first approximately 15 years of FABI's existence, most of the research programmes benefitted from the Technology and Human Resources for Industry Programme (THRIP) funding supported by the Department of Trade and Industry. This co-funding opportunity changed numerous times from its inception to accommodate various government mandates, but overall provided outstanding support for postgraduate education. The effective closure of THRIP in 2015/2016 meant a substantial loss of financial support not only for FABI but for most industry-supported research programmes in South Africa. There is no question that it resulted in a substantially lower number of postgraduate students entering research projects in the country.

A major growth factor for FABI came with the government Department of Science and Technology (DST), now Department of Science and Innovation (DSI), recognising the tree health programme in FABI as one of the first six government supported Centres of Excellence (CoE) in South Africa. This led to the launch of the Centre of Excellence in

Tree Health Biotechnology (CTHB) in 2004. This was initially half-funded, due to the view of the DSI that it had substantial funding beyond what was being given to the other four CoEs. A strong argument was launched against this decision and the CTHB was given full funding from the start of the second of three funding terms (2008–2012 and 2018). This substantial base of funding required the incorporation of research projects at a number of other South African universities, where the team at FABI needed to ensure funding for those projects. While somewhat onerous, this also meant a substantial deepening of FABI's research programme focused on tree health.

A model for postgraduate mentorship and development

During its first 20 years of existence and beyond, FABI provided an outstanding model for postgraduate education. This has been recognised widely within the UP environment and also nationally. There are many factors that contributed to this success. Perhaps the most important is the fact that as a stand-alone institute, FABI is substantially different from a typical university department. Postgraduate students work in a deeply multi- and transdisciplinary environment and benefit from exposure to areas of research that are much more diverse than would be possible in a single department. Likewise, the academics running research programmes in the Institute come from a broad range of disciplines, making collaboration across these domains easily available. The same applies to research funding opportunities where it is common to offer funding bodies a broad range of skill sets that facilitate solving their problems.

Structural leadership and changes during the period

A key factor driving the success of FABI, and that defined the second ten-year period of its existence up to 2018 and beyond, has been the critical mass of postgraduate students whose work was characterised by close engagement in the Institute. By the end of this period, FABI had grown to include approximately 200 MSc and PhD students and postdoctoral research fellows, led by a team of approximately 24 academics. All academics in this case had appointments in faculty departments (Biochemistry, Genetics, Microbiology, Zoology and Plant Sciences) but conducted the bulk of their research within the Institute. Of this team of academics, nine were specifically assigned to FABI and thus reported to the Director of the Institute.



A common feature of research teams or institutes in universities is that the majority of academic staff are connected to the core only by association or personal choice. This implies that, other than say the Director and secretarial support, the research entity rests on a fragile structure, which in many cases might not be sustainable.

During his term as Dean of the Faculty of Natural and Agricultural Sciences, and later as Vice-Principal: Research, Prof Robin (RM) Crewe recognised that FABI required a core team of full-time academics reporting primarily to the Director of the Institute. This is an unusual structure for institutes at UP, but there is no question that it has been key to the growth and sustainability of FABI. While the FABI academic staff all have linked positions in faculties, their core deliverables relate to research and to building research programmes important to strengthening research excellence. While they all have

formal undergraduate teaching responsibilities, the load is lower compared to academics within department.

Another key feature defining the success of FABI has been the fact that students in the Institute represent a remarkable diversity of cultures. At one point during the second decade of the Institute's existence, a count showed that there were 30 mother-tongue languages spoken among the student community. This number has obviously fluctuated over time but it illustrates a deeply multicultural environment. This has been driven by a number of factors, not least by a commitment by the FABI leadership strongly to promote cultural diversity. The fact that the Institute has had a deep global reach with students from many different countries of the world has also been a key factor. It is clearly evident that cultural diversity has strongly driven research depth and excellence in FABI.

Significant outputs, achievements and events hosted

As FABI grew during the 2009 to 2018 period, there was a continued growth of research outputs, measured using all typical metrics. These are summarised in-depth in the regularly produced Biennial Reports¹ of the Institute. Over this period, FABI has come to have a very substantial international research footprint with students and staff having tangible publication outputs with colleagues in many different countries of the world. Research outputs have continuously grown not only in numbers but also in quality with a very substantial focus on publication in high impact journals such as *Science* and *Proceedings of the National Academy of Sciences (PNAS)*.

FABI staff and students have been the recipients of a large number of awards both locally and internationally. These are far too numerous to list but locally it is relevant to note that the FABI academics all have NRF ratings including three A-ratings, seven B-ratings and three staff members with NRF President's Awards. Three FABI academics have been on the Clarivate Web of Science most highly cited list, in one case continuously for several years. Likewise, several FABI academics have held or continue to hold very significant positions on influential scientific bodies. Prof Michael (MJ) Wingfield as Director, received two honorary DSc degrees (North Carolina State University, US and the University of British Columbia, Canada), largely recognising the outstanding international footprint in the field of tree health in FABI.

¹ <https://www.fabinet.up.ac.za/index.php/fabi/fabi-biennial-reports>

² Michael Wingfield, *The FABI Story. The Road to Research Excellence*. January 2018.

The second FABI decade ends

During the course of 2017, FABI founding Director Prof Wingfield made the decision to step down from this position. This was primarily based on his view that the Institute had come to a point where it would benefit from new leadership. There was a clear opportunity to extend the research platforms, largely but not exclusively in the fields of tree (forestry, fruit) health to a much wider sphere of impact. For example, one of the strongest biological control programmes for tree pests had been built in FABI and this could clearly be extended to the broader fields of agriculture. Likewise, opportunities such as expanding the powerful base of disease diagnostics beyond tree health were obvious, but these could only be achieved through new thinking and new leadership.

Prof Mike Wingfield stepped down from the directorship of FABI at the end of 2017. This followed a year-long process conducted by the UP Executive to appoint a new director. Prof Bernard (B) Slippers, a highly recognised academic with long-term experience working as part of the FABI leadership team, was identified as the new director, taking over this role in January 2018.

FABI organised an international symposium entitled 'The Road to Research Excellence'² to mark the occasion of the 20th anniversary of the Institute. The event included keynote speakers representing major role-players from South Africa and globally who had been involved in building the Institute. A narrative summary of the history of FABI was released on this occasion, providing a broad historical perspective of the first two decades of the Institute. The two-day commemoration of FABI also included a tree planting ceremony as a symbolic gesture of FABI's contribution to research and the environment, and an art exhibition of trees and sculptures curated in partnership with the University's Department of Arts.



4 | Future Africa

A fitting conclusion to Prof Cheryl de la Rey's term as the UP Vice-Chancellor and Principal in this period, as she was the driver behind the Future Africa project, was her farewell function held at Future Africa on 29 November 2018.



Prof Bernard Slippers, founding Director of Future Africa | 2014–2018

The critical need for transdisciplinarity, internationalisation and social responsibility of science was increasingly prominent in discussions on the future of science development globally. As captured in a statement by Philip Sharp, Nobel Laureate in Medicine, and Alan Leshner, CEO of the American Association for the Advancement of Science (AAAS) — the world's largest general scientific society:

“Searching for solutions (to today's global challenges) requires that the scientific community operate in fundamentally new ways... Developing effective solutions requires converging approaches, such as the integration of knowledge from the life, physical, social, and economic sciences and engineering... Research-performing and training institutions, such as universities and research institutes, have critical roles to play... it is essential that they develop appropriate training programs and help stimulate multidisciplinary international collaborations.”³

This realisation was driven by the scale and complexity of challenges facing societies around the world and was brought into sharp focus in the University's long-term vision and strategy, UP 2025.

UP was seen to be especially well-placed to play a leading role in Africa and to position the University as a continental and global research network and hub for engagement on major developmental challenges. It was considered by many as one of the few universities on the continent that had the capacity, stature and resources to position itself as a ‘one stop shop’ for Africa and the world to meet and to engage on the grand challenges of the future.⁴

In this context, Prof De la Rey initiated a process in November 2013, based on a pre-proposal developed by Prof Bernard (B) Slippers, to develop a platform that would aim to address two overarching goals for UP:

- To become a vehicle for the active development of *fundamentally* new types of scholars, projects and research networks.
- To address a critical shortage (or lack) of *integrated platforms* for postgraduate, postdoctoral and visiting scholar research and training, and to support incubators of knowledge production; this would offer the opportunity to develop a dynamic living and learning environment where a community of scholars can engage to

³ Sharp PA, Leshner AI. 2014. Meeting global challenges. *Science*, 343: 579. DOI: 10.1126/science.1250725

⁴ Slippers B, Vogel C and Fioramonti L. 2015. Global trends and opportunities for development of African research universities. *South African Journal of Science*, 111(1-2): 1-4. <https://dx.doi.org/10.17159/sajs.2015/a0093>

advance excellence in scholarship, dialogue and social responsibility across disciplines, cultures and generations.

Prof Slippers was seconded to the Office of the Vice-Chancellor in January 2014 to work on the project, with the ideas refined to what became the Future Africa project in the first half of 2014. The original proposals considered, in particular, the work of Young Academies, the Collegiate Model and Centres for Advanced Study at leading universities, the Future Earth project by the International Social Science Council (ICSU), now the International Science Council (ISC), as well as the 2010 internationalisation strategy of UP, developed by a team of UP academics led by Prof Christof (CJ) Heyns who actively participated in the development of the Future Africa proposals.

In the words of Prof Heyns, the exact place is captured of where the Future Africa campus was developed:

“The UP sports grounds and experimental farm, with their trees, dams and open spaces, offer the kind of tranquillity and peace of mind that one does not necessarily expect in a busy city. It is close to the University and to the Hatfield and Brooklyn business and recreation areas. It also offers access to top-class sporting and gym facilities. On the southern rim of the experimental farm there is a large area — with a bit of a view over the farm — that is currently used essentially as a scrap yard for old farming equipment that could be considered for this purpose.

“Further up the red brick road, on Strubenkop, past the house of the farm manager, one can take a footpath to the left, pass the covered reservoir, and make your way up to a point above some rocks where there is an area with a 180-degree view of Pretoria. If it is not designated as a green area, this would be ideal for such a venture. Standing there with your back to the koppie, with the twin towers of the Union Building on your left, you can see the tall structures of the University of Pretoria nearby, while you face north. This is the direction of the vast continent of Africa, the cradle of some of the best and of the worst in the history of the human race. In a few weeks the trees in the orchard below will start blooming. One can easily imagine that some of the ideas that will change the future of humanity will enter human consciousness here.”⁵

The idea was of an institute becoming the anchor strategy of UP as ‘Africa’s Global University’.

⁵ University of Pretoria, August 2010. Africa’s Global University: Report to the Executive by the Task Team to Develop an Internationalisation Strategy, pp.42–43.



A chronology of milestones and events

In May 2014, the UP Executive approved a formal proposal for the 'Future Africa: Transdisciplinary Science Leadership for Innovation' project to advance transdisciplinary capacity development and internationalisation with Africa as a core focus; the development of a facility to house the Future Africa project; and the appointment of a steering committee. The steering committee comprised Profs Slippers (Director), Anton (A) Ströh, Norman (N) Duncan, Lorenzo (L) Fioramonti (Deputy-Director) and Coleen (C) Vogel, with Profs Robin (RM) Crewe and Heyns acting as advisors to the committee.

Following a call for the expression of interest from architects, and two rounds of proposals from a shortlist of architectural firms, Earthworld Architects was appointed. Three potential sites were identified for the development of Future Africa and the south-eastern corner of the Hillcrest Experimental Farm site chosen, in alignment with recommendations for the redevelopment of this space, which were the outcome of an external review in September 2014.

The development of the Future Africa site and infrastructure was overseen by Prof Antonie (AM) de Klerk in his position as Executive Director on the UP Executive, together with the Future Africa Steering Committee.

Further consultation meetings took place with the UP Executive, deans, directors of institutes and all major departments affected or involved with the Future Africa project throughout 2014. Other than the concept, academic focus and development programmes, and the building designs, a key component of the final proposal was a business model for the financial sustainability and motivation for the capital investment. Prof De Klerk and Marietjie (M) de Waal (Department of Finance) were instrumental in this process.

In November 2014, Council approved the funding for the construction of Future Africa. The refinement of designs was undertaken by Earthworld Architects, in consultation with academics and UP Facilities Management during 2015. Further funding was approved in July 2016 for the development of the conference facility at Future Africa.

The latter part of the process was led by Profs Slippers and Fioramonti, and overseen by Prof Ströh, following the retirement of Prof De Klerk in 2015.

A proposal for the formal establishment of Future Africa as an institute was approved by UP Senate in 2018. Also in 2018,

as the construction of the Future Africa campus was nearing completion, the Vice-Principal: Research and Postgraduate Education, Prof Stephanie (SG) Burton, was appointed as the Executive member responsible for overseeing the operationalisation of Future Africa. Interim organisational structures were set up to facilitate the processes of decision-making and to ensure the implementation of those decisions.

A philosophy of participation, inclusivity and collaboration was adopted as being central to the functioning of these structures.



The start of operations

Agreements for collaboration were signed with the African Institute for Mathematical Sciences (AIMS), the Next Einstein Forum, and Microsoft, among others.

Three appointments were made in this first phase of Future Africa's operations:

- Smeetha (S) Singh was appointed in July 2015 as programme coordinator of the Africa Science Leadership Programme (ASLP).

- Amelia (A) Cilliers was appointed as Future Africa's project manager in mid-2016 and helped oversee all elements of the engagements, planning, budgeting and administration as the project developed over the following years.
- Following a call for the expression of interest and two rounds of presentation from design companies, Albino Creations was appointed to design a logo for Future Africa in May 2016 and a style guide for the development of the Future Africa website in June 2016.

Importantly, the logo captured themes of the African continent, circular African design elements, inter-connectedness, biological cells and chemical structures. The logo was registered as a trademark of UP in June 2018. Apart from the website and associated list servers, social media platforms (Twitter, Facebook and Instagram) were also actively developed and promoted during this period.

Science leadership programmes

A significant first programme of Future Africa was developed following funding from the Bosch Foundation to establish an African Science Leadership Programme (ASLP), linking and equipping science leaders from across the continent, under the leadership of Prof Slippers and in collaboration with the Global Young Academy (in particular, Dr Eva (E) Alisic, University of Melbourne, Australia).

A knowledge and development facilitation company, KnowInnovation, was key in the development and implementation of the ASLP programme, together with the leadership of the Leopold Leadership Programme at Stanford University (US).

The programme included 20 fellows per year and, from the start, had a significant reach given its unique approach and impact. The ASLP concept was taken up and expanded globally via the Global Young Academy, including the Association of Southeast Asian Nations (ASEAN) region and at their global gatherings. Funding for the programme was renewed in 2018, and satellite programmes were then developed via the ASLP in South, East, West and North Africa.

By 2018, the programme had become one of the most visible science leadership programmes globally, reaching and linking hundreds of young scientists around the world.

A Tuks Young Research Leader Programme (TYRLP) was also established at UP using the ASLP concept. Between 2015 and 2018, this programme impacted and connected 80 young researchers from across UP's faculties. It created a vibrant and inspiring space. The TYRLP programme aimed to grow early career academics at UP in the areas of thought leadership, team development, engagement and collaboration with the intention of enabling them to solve the complex issues that face society. The programme formed a community within the University of like-minded young researchers who would contribute to UP becoming a leading research-intensive university.

A Carnegie funded Early Career Research Leadership Fellowship (ECRLF) postdoctoral programme also flowed from these programmes. Dr Nokuthula (N) Vilakazi was appointed as coordinator of the programme. The programme design for the ECRLF aimed to stimulate new thinking on the perceived frontiers of science to produce theoretical frameworks for transformation, develop novel questions and/or novel approaches to old and emerging new questions with a focus on adaptability, resilience, and co-design of systems for sustainable and equitable development in Africa.

The programme functioned through a twinned, split-site approach with the home institution to strengthen the research of the fellow at her/his home institution as well as the hosting institution. The ECRLF aimed to grow African academics with an intention to stimulate the emergence of centres of research excellence to solve complex problems that face Africa and the world.

The communities of young research leaders in the ASLP, TYRLP and ECRLF were seen as the start of developing a network of researchers linked to Future Africa across the continent. This community was virtually linked through a programme emerging from the ASLP called ConnectUs.Africa, to networks of young researchers linked to Young Academies and other initiatives on the continent.

A new beginning

The Future Africa launch took place on 29 March 2019, with planning having started in mid-2018. Apart from the main programme, the launch was planned to include workshops on science leadership in Africa, transdisciplinary research in Africa, and science communication and science diplomacy in Africa, which heralded in new beginnings.

The campus and gardens

The Future Africa campus was designed to revolve around a lifestyle of research excellence and collaboration, with a deliberate focus on how design can play a role in fostering critical thinking and research. Drawing on the contemporary eco-village solutions, and ideas from the Stanford Woods Institute for the Environment, communal areas were designed to spur creative thinking and innovation.

The Future Africa campus includes a conference centre, a dining hall, administrative and research offices, and 265 living units ranging from single bedrooms to family units.



The research commons, for example, is designed to use the interconnectedness between different spaces in the flow designed between informal discussion areas, meeting rooms and study tables. The conference centre is the focal point of the campus, where knowledge as a collective is pivotal to the campus.

The gardens were landscaped and plant species carefully chosen to ensure that much of the vegetation is edible and could be used in the kitchens and, into the future, as a useful focus of research. The possibility of an urban landscape providing food for fauna and people also highlights the predominantly indigenous landscape as a food resource, and how this resource can be used.

The main features

The main features and activities of Future Africa would include:

- An innovative research environment, as illustrated in the design and landscape of the Future Africa campus.
- IdeasLab-type workshops⁶ that bring together communities of practice from across Africa and globally to engage in challenges that require transdisciplinary solutions.
- Frontiers research projects that flow from IdeasLab workshops and the [Global Innovation Forum](#) (see below) and that can be developed into innovative

⁶ The IdeasLab concept is applied widely. See for example, <http://knowinnovation.com/ideas-lab/>

transdisciplinary projects. The ultimate aim would be to have a coherent programme on the new frontiers of research, with a special focus on adaptability, transformability and co-design of various social and ecological systems for sustainable and equitable development in Africa.

- Global Innovation Forum aimed at Future Africa taking the lead in hosting an annual gathering of 'innovators' from all over the world. If done strategically and building on existing initiatives (e.g., the annual Governance Innovation Week hosted by the UP Govinn centre, the efforts of the Centre for Human Rights, the newly established Centre of Excellence in Food Security and many other UP initiatives), this gathering holds the potential to become a leading global event in which the global innovation community — from research organisations to think-tanks and business and civil society — participate to tackle the world's most pressing challenges.
- The intentional recruitment of talented young researchers in Africa and globally with the aim of developing 'dream teams' that have unique skills in different disciplines, to partner with established senior scientists on frontier projects. Emphasis will also be placed on building leadership skills that will enable young scientists to play a critical role in the interface between science and policy in the 21st century, as well as to play a leading role in global research projects. A prestige African science leadership programme for early to mid-career researchers of exceptional potential will be offered in partnership with the Global Young Academy.
- The focus on academic mentorship as a foundational value of Future Africa to nurture a new generation of scholars at UP and in Africa. Learning from successful models at UP and elsewhere, Future Africa will offer bursaries to undergraduate students of outstanding quality to work with Future Africa PhD students. Furthermore, Future Africa research and postdoctoral fellows will be equipped to act as mentors in skills development programmes aimed at PhD students. A select group of early career academics, linked to the frontier research and leadership development projects, will be offered career advancement grants for paired

sabbaticals with research visitors at Future Africa, or at the research organisation of a leading scholar. All Future Africa fellows and, where possible, a broader scholarly community, will be regularly linked through social and academic activities to build relationships and enhance learning in a transdisciplinary context, with a focus on African development.

- Future Africa will seek to establish a *Nature Africa* online journal, in collaboration with the Nature Publishing Group. The journal will aim to highlight excellence in science from Africa on issues relevant to Africa, as well as science opportunities and dialogues relevant to African science. Attempts will also be made to build similar partnerships with leading journals such as *Science*.

Research focus areas, early ideas

The grand challenges facing Africa and the world have been analysed and prioritised through extensive processes such as those captured in the South African National Development Plan 2030, the African Union 2063 strategy, and the UN Strategic Development Goals.

Considering these in-depth analyses, and matching them to areas of research strength and opportunity at the University of Pretoria, four overarching research focus areas have been identified for Future Africa:

- Governance and development
- Human rights and social justice
- Bio-economy and One Health
- Convergence and sustainability science.

Many of the grand challenges facing Africa and the world lie at the intersection of the first three areas. In advancing these fields, an emphasis will be placed on the points of convergence between them, developing a centre of excellence in convergence and sustainability science. This emerging field aims to integrate knowledge from the life, physical, social and economic sciences, and engineering, and can play a critical role in narrowing the disconnect between science, practice and politics.

5 | Javett-UP Art Centre

The birth of a new gallery

Prof Antony (AP) Melck, first appointed in October 2001 as advisor to the Vice-Chancellor and Principal, Prof Calie (CWI) Pistorius, and later as Executive Director responsible for institutional planning, chaired the University's Art Committee. In all these capacities, a growing number of tasks, questions and discussions were entertained over many years, which included matters such as selecting and caring for UP's artworks, housing them appropriately, exhibiting the (exam) work of Visual Arts students, managing UP's diverse museum collections, and the need for a single, permanent solution related to the foregoing. In relation to the latter point, two options were mooted: developing one of many possible existing venues, and building a new art gallery.

The idea of building a new art gallery was first mooted late in 2005, when the UP Executive accepted, in principle, a proposal that planning for a new building should start. It was realised from the outset that external funding would have to be found. In-principle agreement to proceed was followed by a meeting on 3 March 2006, convened by Prof Melck, with the heads of the departments of Visual Arts, Prof Marion (M) Sauthoff, and Architecture, Prof 'Ora (O) Joubert, to discuss the situation and to prepare a needs analysis for the Executive Director: Facilities, Prof Antonie (AM) de Klerk, a brief for an architect, and a fundraising brochure. This meeting agreed that the space adjacent to Lynnwood Road, between the Visual Arts and Architecture buildings, would be suitable for the new gallery, complete with the linkage it provided to staff and students. The new gallery would also connect both the South Campus and the historical buildings to the north, and would be suitable for housing student, contemporary, rotating (external) and corporate (University) collections.

At the time, the architect, Marcus Holmes was assisting UP with the restoration of the Old Arts Building. In addition,

Prof Alex (A) Duffey, Head of UP Arts, was preparing a new museum policy that would resort with the Registrar through a newly-formed University Heritage Committee. This was a response to the realisation that there were too many University collections to be housed under one roof.

Discussing architectural requirements at various levels in the University, and preparing a range of submissions and reports, took several years. Key in this regard was a report written by Dr André Breedt after a study tour to art galleries abroad in 2007. In October 2009 the University's Executive reviewed the identified needs, reconfirmed the establishment of an Arts Centre, and appointed Prof Schalk (SJ) Claasen as project coordinator and manager. Prof Claasen was seconded from the Faculty of Engineering, Built Environment and Information Technology (EBIT) for this purpose. A year later in September 2010, Prof De Klerk submitted the first cost estimates to the Executive. Prof Claasen was succeeded by Prof Anton (A) Coetzee and, from the beginning of 2014, by Prof Annél (A) van Aswegen, as coordinators.





Christopher Till, founding Director of the Javett-UP Art Centre



Brokering a partnership

The possibility of external funding only became a focus during 2011. By that time, there had been a number of changes in the senior management of the University. Prof Cheryl de la Rey was the new Vice-Chancellor and Principal, and the new Heads of Department of Visual Arts and Architecture, were Prof Jeanne (J) van Eeden and Prof Karel (KA) Bakker respectively.

15 June 2011 is the date on which a future partnership was brokered. This was when Prof Melck met with Dr Conrad (C) Strauss and Stephan (S) Welz, both renowned in South African art circles, on their referral to the former by Dr Breedt. The two external persons agreed that the climate was favourable for establishing a new art gallery, requiring substantial donations (covering construction, running costs and artworks), and agreed that UP would be a suitable host given that the University was a well-managed and stable institution, located in the capital city, with an art collection and an active Visual Arts Department. They also indicated the next logical steps would be to make appropriate land available, and establish an independent legal trust, governed by trustees, to take responsibility for the collections and run the facility.

The final development began a few months later in 2011, when Mr Welz invited Prof Melck to a meeting with Michael Javett in Rosebank, Johannesburg. Mr Welz had been Mr Javett's advisor on art purchases for his personal collection. The matter of possible funding, as lead donor, for the new art gallery was raised. This was pursued further early in 2012 when

Mr Javett referred Prof Melck to his lawyer, Ed Southey, to prepare first drafts of a donation agreement and trust deed to underpin the venture. Prof Melck asked Prof Bakker to suggest an architect to assist with cost estimates, the result being the suggestion that Pieter J Mathews and Associates be approached. This decision was endorsed after a subsequent meeting between Mr Mathews, Mr Welz and Mr Javett.

On 2 October 2012, Mr Javett met Prof De la Rey, further cementing donation commitments subject to University Council support and approval. On 9 January 2013, Southey and Prof Niek (N) Grové, the respective lawyers of the Javett Trust and University, met and requested Prof Melck to brief the Standing Committee of Council, who responded positively. Through Prof De la Rey, grant and travel assistance was secured from the Andrew W Mellon Foundation, New York, for a study tour of art galleries and museums at leading academic institutions in the United States. From 20 to 31 March 2013, a delegation consisting of Mr Welz⁷, Mr Mathews, Prof Norman (N) Duncan (Dean of the Faculty of Humanities) and Prof Melck undertook this visit. Profs Melck and Duncan submitted a report to the UP Executive on 11 April on lessons learnt from the institutions visited.⁸

The outcome of these interactions was that Council, on 26 June 2013, authorised Prof De la Rey to enter into a legal arrangement in relation to developing the Art Centre. Council thus de facto approved that the University could commence with preparations to implement the proposal to establish a foundation and construct the gallery building. A Deed of Trust was signed on 13 June 2014 between the University of Pretoria as Founder and the Trustees for the new Arts Centre Foundation (ACF). The stipulations that provided for the University to make the land available for the building on the Hatfield and South campuses, including additional funding for underground parking on the South Campus, allowed Mr Javett to effect his intended donation of funding and the loan of artworks. The Master of the High Court issued the letters of authority to the Trustees in August 2014. The ACF was registered as a non-profit organisation and granted public-benefit organisation status by the South African Revenue Services (SARS).

Linking with the capital city

Prof Melck had regular contact with the mayor and city manager of the City of Tshwane (CoT) during the conceptualising of Javett-UP and establishing the ACF. Prof Melck chaired the City's audit committee and could, at the appropriate time, submit to the CoT Executive the University's intention to approach the UP Council for support and permission to proceed with the Art Centre.

A first task was securing the rights for the proposed Art Centre building to be designed to cross Lynnwood Road. This was a key element of the plan for the Centre. 'The Air Bridge' Lease Agreement was signed with the CoT on 12 October 2016.

The tender process for the construction was concluded in August 2016 and Liviero Building (Pty) Ltd was awarded the contract. Site handover for construction took place on 27 June 2017. The completion and functional occupation of the building took place in May 2019 and the Occupancy Certificate was received at the end of August 2019.

A vision beyond the arts

The Javett-UP's future work was embedded in its vision of contributing beyond the arts.

A workshop on the envisaged Art Conservation programme and related matters, held early in March 2015 at UP, led to Andrew W Mellon Foundation grant support, and the start of a master's programme in the Conservation of Tangible Heritage from 2019. A space in the gallery building was designated as a Conservation Studio.

Javett-UP Art Centre opened its doors for the first time in September 2019 under the leadership of Christopher (C) Till, its founding Director.

⁷ Mr Welz passed away in December 2015.

⁸ Museum of Modern Art (MOMA), The Metropolitan Museum of Art (New York), the Guggenheim Museum, the High Line precinct, the Whitney Museum of Modern Art, the University Museum at Rutgers, Yale, Princeton and Johns Hopkins Universities, the Baltimore and Pennsylvania Museums, and the Barnes Foundation and Museum.

6 | Engineering 4.0

Engineering 4.0 is situated on the Innovation Africa@UP campus in Hillcrest and is officially part of the Faculty of Engineering, Built Environment and Information Technology (EBIT). It arose from a UP collaboration with the South African National Roads Agency (SANRAL), the Council for Scientific and Industrial Research (CSIR), and York Timbers.

Initial discussions for the development of the facility started in 2014, with talks between UP and SANRAL about a possible location for a national reference laboratory for road building materials. The discussions evolved to include a training laboratory, a concrete research laboratory, an accelerated pavement testing track, and an active traffic test track on the N4 that all became part of the package following discussions with various local and international peers and facilities.

The construction period for Engineering 4.0 stretched from 17 October 2018 to 28 February 2020, when the facility was officially handed over to UP — on time and within budget. This was achieved through the professional endeavours of UP Facilities, the professional team (consisting of the architects, engineers, quantity surveyors, etc.) and the contractor that strictly adhered to the plan, delivering a world-class facility. The description below provides an overview of the mandate, strategy and plans.

Mandate

The original mandate of the Engineering 4.0 facility was to address the shortage of civil engineers in South Africa with specific reference to the provision, management and maintenance of roads infrastructure while providing a national facility for roads materials reference testing, and training, teaching and research in roads materials, construction, management and maintenance.

The national road materials reference laboratory will become the only site in South Africa for the independent testing of materials for the road construction industry. The training laboratory will train and certify road materials technicians employed by various testing laboratories to ensure that road materials testing in the country is up to standard. The concrete laboratory was designed to consist of preparation areas, curing and humidity rooms, and a test floor where various concrete and structural testing can be conducted for use in areas that include road construction and infrastructure.



Prof Wynand Steyn

An Accelerated Pavement Testing (APT) track will allow for the construction of different pavement structures and their accelerated evaluation, using a mobile APT device. This will enable engineers to monitor the expected behaviour of a pavement over a fraction of its life. The active traffic test lane on the N4 will be used to collect real-time data and use big data analytics, and the Internet of Things, to conduct tests and analysis on how different road surfaces perform, how traffic moves on the highway, density and type of traffic, emissions testing and air quality monitoring.

The York Wood Engineering Laboratory aims to expand the footprint of mass timber construction, using advanced engineered wood products on the continent, in collaboration with civil and chemical engineering, architecture, materials science, data science, genetics and other related bio-economy disciplines.

This mandate has evolved since the inauguration of the facility to include a hub of transdisciplinary thinking, collaboration and support at Innovation Africa @UP, supporting various entities in the vicinity with mainly engineering and technology support. Engineering 4.0 shares its vast resources in technology and data sciences with all faculties via the Future Africa Institute, a platform for developing inter- and transdisciplinary research networks within the University and the global research community — focusing on solving Africa's grand challenges.

Strategy

The strategy employed in the development of Engineering 4.0 strongly focused on a partnership with industry. SANRAL had a clear requirement for developing capacity and knowledge in its domain of roads provisioning, while UP has had strong teaching and research interest over many years in the broad infrastructure, and focused roads infrastructure area. A strategic agreement for the development of the facility, therefore, made them equal partners in the development, with both CSIR and York Timbers coming on board as technology research partners to enable a collaboration that can address complex challenges while developing the next cohort of researchers, engineers, technologists and scientists for the region.

The strategy was amended after the completion of Engineering 4.0 also to include the wider support of transdisciplinary efforts on the UP Hatfield Campus, focusing mainly on the engineering aspects of collaborations with various entities.





Credit: Wynand Steyn

Partnerships and plans

The facility was initiated as a partnership between UP, SANRAL, CSIR, York Timbers. UP and SANRAL each contributed half of the total budget to develop the facility, while CSIR and York Timbers both became active research partners to ensure a collaborative national research and development footprint.

The current Engineering 4.0 facility is Phase 1 of the masterplan development on the Innovation Africa @UP Campus, with further planning around provision of facilities for water, mining and mechanical engineering, autonomous vehicles and new energy planned as part of the next phases of development. All these developments are conducted with strong industry support and collaboration, with the aim of improving quality of life for all communities in South Africa.

Themes embodied in Engineering 4.0 future work

The research themes have focused mainly on ways to improve quality of life around transportation for societies. Engineering 4.0 focuses on the development of integrated transportation and infrastructure systems, with research concentrating on the reduction of energy consumption levels in transportation, maximising productivity in industry and creating a higher quality of life for society. Specific research themes include road and general infrastructure materials and construction, smart transportation systems, vehicle-pavement interaction issues, traffic flow, infrastructure management, exhaust-related emissions, semi-autonomous and autonomous vehicles, and more. This will entail smart roads and infrastructure talking to smart vehicles, to reduce traffic



Credit: Wynand Steyn

congestion and ensure the safety of passengers and cargo. Such research will also affect related fields such as agriculture and logistics, where transporting food can be improved to reduce wastage or damage to fresh produce. The concept of digital twins of in-service infrastructure became one of the newer research themes, in conjunction with a host of other departments and faculties on campus.

The facility will become a place where novel ideas, scientific research, global expertise, students, academics, entrepreneurs and industry partners can meet to generate new thought leadership, innovation and training opportunities through collaborative partnerships.

The completion and handover of Engineering 4.0 on 28 February 2020 was followed by the first Covid-19 lockdown that severely affected the original plans for that year. The

official opening planned for 13 May 2020, was postponed until 30 November 2020 and several other adjustments needed to be made.

However, there were also positive unintended consequences of the delay, among which was the facility quickly becoming a base for the provision of various transdisciplinary activities at Innovation Africa @UP, offering, inter alia, a wide area wireless network that supports wireless sensors in facilities operated by EBIT, the Faculty of Natural and Agricultural Sciences (NAS) and the Forestry and Agricultural Biotechnology Institute (FABI), and hosting discussions ('Kindle the UP Fire') where leading thinkers of various faculties interact to discuss solutions to complex societal challenges, and potential solutions to such challenges through transdisciplinary collaborations.

7 | Unsettling Paradigms

Inspired by developments in the social movement for transformation in the higher education landscape since 2015, the project — ‘[Unsettling Paradigms: The Decolonial Turn in the Humanities Curriculum at Universities in South Africa](#)’ — has stimulated and strengthened work in the vital but under-researched field of curriculum transformation. With generous funding from the Mellon Foundation (R34 million), and led by the University of Pretoria and principal investigators Profs Vasu (V) Reddy and Maxi (M) Schoeman, this supra-institutional collaboration brought together eight research-intensive universities: Pretoria (UP), Witwatersrand (Wits), Free State (UFS), Rhodes (RU), Western Cape (UWC), Cape Town (UCT), KwaZulu-Natal (UKZN) and Stellenbosch (SU).

At an institutional level, the UP Senate approved the ‘[Reimagining curricula for a just university in a vibrant democracy](#)’ framework in May 2017⁹. The document highlighted four drivers for curriculum transformation:

- Responsiveness to social context
- Epistemological diversity
- Renewal of pedagogy and classroom practices, and
- An institutional culture of openness and critical reflection.

The nomenclature of the grant discloses a key focus and intention aligned to the strategic intervention at UP. If to *unsettle* means to alter from a settled state — to cause to be no longer firmly fixed or established — then we are undoubtedly living in times where our paradigms (assumptions, concepts, values and practices) have been called into question. Our received notions have been shaken, weakened and perhaps disturbed (in part by the student movement but also because the university is fundamentally an institution built on and defined by a larger project of change). It matters because universities have a moral obligation to instigate and create change. It benefits not just the institution but the country too and our location in the world.

The ‘decolonial turn’ explores how we produce new or different renditions of the humanities curriculum.

While decolonisation directs attention to a colonial (and apartheid) past and a postcolonial (post-apartheid) future, it simultaneously challenges structures of exploitation, inequalities and power. Decoloniality, in turn, pushes beyond the postcolonial (which exposed global Eurocentrism) towards the decolonial by directing the critique to the roots of epistemology (what we know and of ways of knowing) and ontology (who we are, our being).

Decoloniality challenges the dominating forces of monoculturalism, Eurocentricism and western epistemologies by surfacing the knowledge domain in the production of pluriversity and epistemic justice — in other words, the value of multiple voices and perspectives to make sense of the world we inhabit.

A long-term view and framework

The intention of participating universities was to place the issue of curriculum transformation in the humanities centre-stage with a view to the long term. In other words, the core aim was that the original five-year programme and grant would be used in such a way as to ensure the longer-term sustainability of a transformation agenda; and further, that by strengthening knowledge, students will be empowered better to understand the dynamics of human and social behaviour at all levels.



⁹ Framework developed by the Curriculum Transformation Workstream (April 2017); approved by Senate (May 2017, S4466/17).

The conceptual and organising frame of the programme was fourfold, viz.:

- *Recovery* — mapping curriculum change over time;
- *Reassessment* — an interrogation of canonical figures and themes within current syllabi to produce a decolonial epistemic perspective;
- *Repositioning* — curriculum transformation that aims to bring a more holistic understanding of the world in which we live; and
- *Praxis* — making the knowledge and insights gained meaningful and tangible in the interaction and collaboration with students.

Four discipline clusters informed the project: the core humanities, the core social sciences, the visual and performing arts and the applied social sciences.

Organised around 'theory and research', 'theory and teaching', and 'hidden curriculum and embedded practices', the themes served as thematic work clusters which incorporated the conceptual and organising frame:

- *Theory and research* focused on knowledge production from the global South, and decolonising research methodologies;
- *Theory and teaching* addressed students as participants (and co-creators) in knowledge production; and
- *The hidden curriculum* engaged influences at the level of organisational structure and culture found in the spaces, symbols, narratives and embedded practices that constitute the university and in the diversity, or lack thereof, of staff and student cohorts.

Achievement and anticipated outcomes

Underlying and supporting the thematic work clusters was the development of an Open Online Knowledge Portal¹⁰ which would serve as an archive and a repository of sources and resources to be used by all participating institutions and other tertiary institutions in South Africa, in order to share the knowledge and expertise generated by the partners. By 2018, the end of the review period, the portal had been developed and was ready to be populated with the resources and publications generated through this large-scale project.

The outcomes were planned to be a body of research *about*, and the result of, the decolonisation of the humanities

curriculum in South Africa. These outcomes were intended to include journal and book publications, a visual record (a documentary film), a number of postgraduate dissertations and theses, and a range of new curricula developed on the basis of the research conducted.

A significant achievement of this project was the establishment of a journal dedicated to decolonisation studies, the *Journal of Decolonising Disciplines (JDD)*, with Volume 1(1) published in 2019 as one of the first major outcomes of the project.¹¹ The administrative hub of this journal is in the Faculty of Humanities at UP.

The project also gave rise to another initiative that is rapidly growing in scope and size, viz. a press/publishing house, also at the University of Pretoria — the Emerging Scholars Initiative (ESI)¹² — dedicated to the publication of journals, monographs and edited volumes related to issues of transformation in a South African context or from a South African perspective. Initially, the press was aimed at assisting young and emerging scholars with a publication outlet, serving also as a writing school and mentoring young scholars to prepare them for aspects such as peer review, academic writing, reporting on research, with senior scholars (locally and abroad) serving as mentors and reviewers. Soon, though, it became clear that there was a wider demand for such a service.

Projects and partnerships planned

There was a host of projects planned for the initial five-year timespan of the project, with several intended to branch out to include partnerships with historically disadvantaged South African universities.

To illustrate some of the ideas:

- In a collaborative initiative, the Philosophy Departments at Rhodes and Wits universities planned to redesign their Philosophy syllabi, strongly to focus on African philosophy, and continental and analytical philosophy from an African perspective.
- The universities of Kwa-Zulu Natal and the Free State initiated a joint project on multilingualism, and the University of the Free State established an Academy for Multilingualism inspired by transformation issues.
- At the University of KwaZulu-Natal, the first of a new summer school series focusing on 'Decolonising Knowledge and Power' was offered in 2019.

- At UP, the Faculty of Law established a university-wide curriculum transformation seminar series that provided an opportunity for scholars to share their experiences and insights regarding curriculum transformation.

It is quite clear that this intra-institutional project made, and continues to make, a huge contribution to the 'decolonial turn' and has a long-term impact for the very reason that it successfully created the opportunity for several South African universities firmly to embed the idea of 'curriculum transformation' in the humanities as part of an ongoing process.



¹⁰ <https://www.up.ac.za/unsettlingparadigms>

¹¹ <https://upjournals.up.ac.za/index.php/jdd/issue/view/269>

¹² <https://esipress.up.ac.za>