

# NELSON MANDELA UNIVERSITY



A World-Class, Engaged, Transdisciplinary  
**21st Century African  
Faculty of Science**

Strategy 2030

**Diversity, Equity and Inclusion in Science**

Action without vision is only passing time, vision without action is merely day dreaming, but vision with action can change the world.

– Nelson Mandela and Joel A. Barker

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# Africa Focused, Globally Influential and Impactful

Message from the Executive Dean of the Faculty of Science  
Professor Azwinndini Muronga

**S**trategy 2030, concluded in 2021, determines the direction and brand of the Faculty of Science at Nelson Mandela University - the only university in the world to carry the name of global icon Nelson Rolihlahla Mandela. This is the first time the Faculty has embarked on a decadal strategy formulation to shape its future direction.



As a Faculty we aim to be identified by our Africa-focused curriculum, research and innovation, and the African value system of Ubuntu. Engagement & Partnerships are part of the core focus of the Faculty and we have taken an intentional position to put these on the same footing as Learning & Teaching and Research & Innovation.

At the time of publishing this Strategy, it is important to note that 2022 has been a very productive year for the Faculty, with our hosting of the African School of Fundamental Physics and Applications (ASP2022), our celebrating of the International Year of Basic Sciences for Sustainable Development (IYBSSD) and the centenary of the International Union of Pure and Applied Physics (IUPAP) of which South Africa is one of the 13 founding members, and which now has 60 member countries.

Our Strategy includes escalating the efficiencies of our systems through the digitalisation of our processes, and developing infrastructure within the physical spatial plan; modernising of it and building future-oriented infrastructure using 4IR technology for multi-purpose use by integrating physical, digital and biological systems, and driving the digital transformation within the University and society.

We strive to distinguish ourselves in the context of national, continental and global challenges, with an encompassing focus on the UN Sustainable Development Goals (SDGs), the Africa Agenda 2063



and the goals of South Africa's Department of Science and Innovation (DSI) white paper (policy) and its decadal plan.

This requires of us to live up to our Vision of being a world-class, engaged and transdisciplinary African Faculty of Science that responds to socio-economic and environmental challenges in society. In our curriculum, research, innovation and engagement, we need to be Africa-focused while being globally influential and inclusive of diverse knowledges, which are essential in this time.

We are driven to contribute to innovation and knowledge in the industrial revolutions of the 21st century, which bring with them a fleet of new careers and also opportunities that do not yet exist.

Everything we do as a Faculty needs to be foregrounded with the guiding principle of diversity, equity and inclusion for the access and success of our students and staff.

Our graduate attributes (listed in this publication) must shape our curriculum in order to prepare our students for life, for future work and to have the adaptability required to solve the socio-economic and environmental grand challenges.

The academic structure in the Strategy has been shaped by the future-thinking direction the Faculty should take. The Faculty is encouraged to use the Strategy to pause and reflect on what it would like to discard in terms of outdated areas and include in terms of new niche areas, both in the curriculum and research.

Transformation of the Faculty is intrinsic to this process. We anchor transformation in the philosophy of diversity, equity, and inclusion in the sciences, using the holistic definition of diversity, including diverse ideas, diverse fit-for-purpose programme offerings and demographic diversity in the student and staff composition, processes, systems, selection committees, committee structures.

Diversity and transformation also talks to the need for the ongoing decolonisation of the curriculum process, including introducing science in Africa, indigenous African knowledge and the history of science, technology and medicine.

Transformation also includes the renaming of spaces within the Faculty, such as the renaming of Building 127 to Inkanyezi Building (meaning 'star' in the Nguni languages). Another of our buildings has been renamed Mvezo after the birthplace of Nelson Mandela and another is now the Katherine Johnson Building, named after the woman who made it possible for the first man to land on the moon.





The crafting of the Faculty's Strategy 2030 was based on diversity, equity, and inclusion, with representation from all our Faculty structures. The intention was to ensure the whole Faculty contributed, as this way it is owned by the Faculty. To achieve this, we immersed ourselves in an engaged, in-depth, faculty-wide process of defining the Strategy, based on our Strategic Priorities, Goals and Objectives.

The journey required of us, inter alia, to think about and discuss the size and shape of the Faculty, and the Faculty brand. It required dismantling outdated academic silos and reorganising the disciplines, entities and programmes into cross-cutting academic clusters and streams that operate in an inter- and transdisciplinary manner. It also required the inclusion of new disciplines and areas of growth, including, inter alia, Computational and Data Sciences; Space Sciences; Atmospheric and Oceanographic Sciences; Biomaths, Biostats, Biophysics, Bioinformatics and Genetics; Science and Technology in Society; and Science Communication, Awareness and Advancement.

We identified six Strategic Priorities or focus areas, each led by a senior Faculty task team leader to develop Strategic Goals (SGs), Strategic Objectives (SOs) and Strategy Activities (SAs) to achieve the SGs:

## Learning and Teaching

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By 2030 we aim to achieve the following:

**To be learning and teaching from a 21st century, Africa-purposed science curriculum that responds to socioeconomic and environmental challenges.**

## Research, Training, and Innovation

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By 2030 we aim to achieve the following:

**World-class, cutting-edge research outputs and innovation, and student-centric training that is locally and Africa-focused, as well as globally impactful and competitive.**

## Engagement and Partnerships

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By 2030 we aim to achieve the following:

**An engaged, 21st century African Faculty of Science.**

## Resource Stewardship

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By 2030 we aim to achieve the following:

**A sustainable Faculty of Science.**

## Transformative Structures, Systems, and Processes

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By 2030 we aim to achieve the following:

**Transformative structures, systems and processes that enable and serve as catalysts in achieving the Faculty's Strategic Vision.**

## Students and Staff Access and Success

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By 2030 we aim to achieve the following:

**An accessible Faculty of Science that is recognised for its student and staff success.**



In 2021 our Strategy 2030 received the full support from the Faculty Board and other institutional governance structures all the way to the University Council. The Faculty appreciates the support of the Chancellor, the Chair of Council, and the Vice-Chancellor in our pursuit of the University's central tenet: 'Taking Nelson Mandela University Boldly Into The Future in Service of Society'. We use this interchangeably with the Faculty of Science's tenet 'Science for Society'.

As a Faculty we now need to craft our Strategic Implementation Plan. This process will be concluded by mid-2023 and we will follow similar processes used to craft the Strategy itself, with diversity, equity and inclusion as a guiding principle.

We bear a huge responsibility in shaping the future of the Faculty for which we are compelled to think far beyond the box as Einstein did if we want to better understand and positively contribute to our world and cosmos.

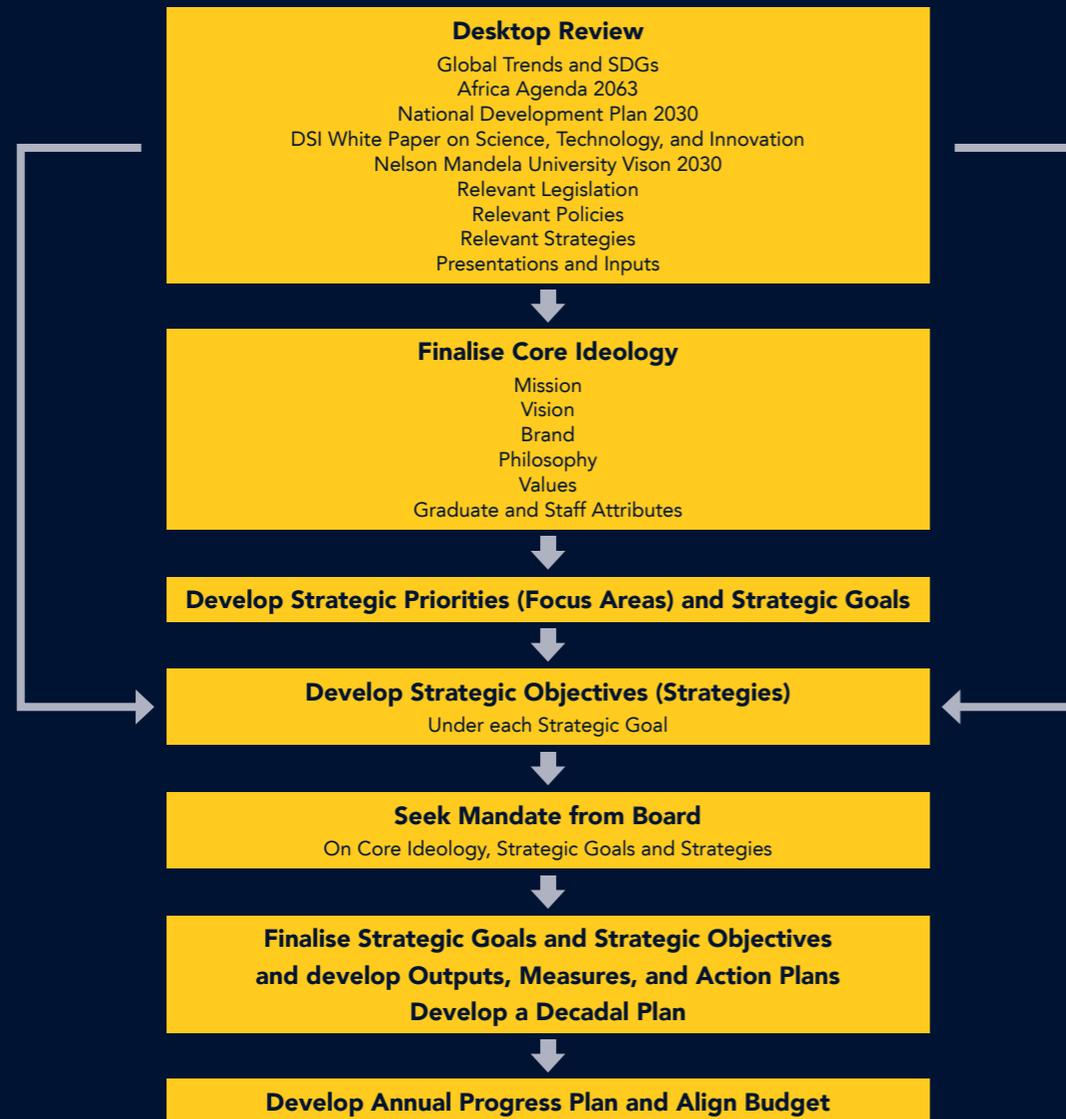
In 'The Structure of Scientific Revolutions' by American physicist, historian and science philosopher, Thomas S. Kuhn, he explains that the history of science teaches us that major scientific breakthroughs only happen because of radical thinking away from the norm or traditional scientific thinking. These examples, albeit from physics, are generally instructive in our infotech and biotech age where the phrase 'paradigm shift', popularised by Kuhn, gave it the meaning it has today.

As a Faculty, we encourage our students and staff to think radically away from day-to-day thinking in order to achieve our vision, mission, values, graduate attributes and strategic priorities and objectives. This requires moving out of our comfort zone. It means phrases like 'this is how it has always been done' have to give room for new, diverse and inclusive ideas.

If we miss this window of opportunity to define what matters and shape the future of science, technology and innovation, in ways that promote the common good, enhance human dignity and protect the environment, the chances are that the challenges we face today of inequality, poverty, unemployment and environmental degradation, will only become worse and compromise the wellbeing of all.

The good news is that change is entirely within our power, and we know that Nelson Mandela would champion this.

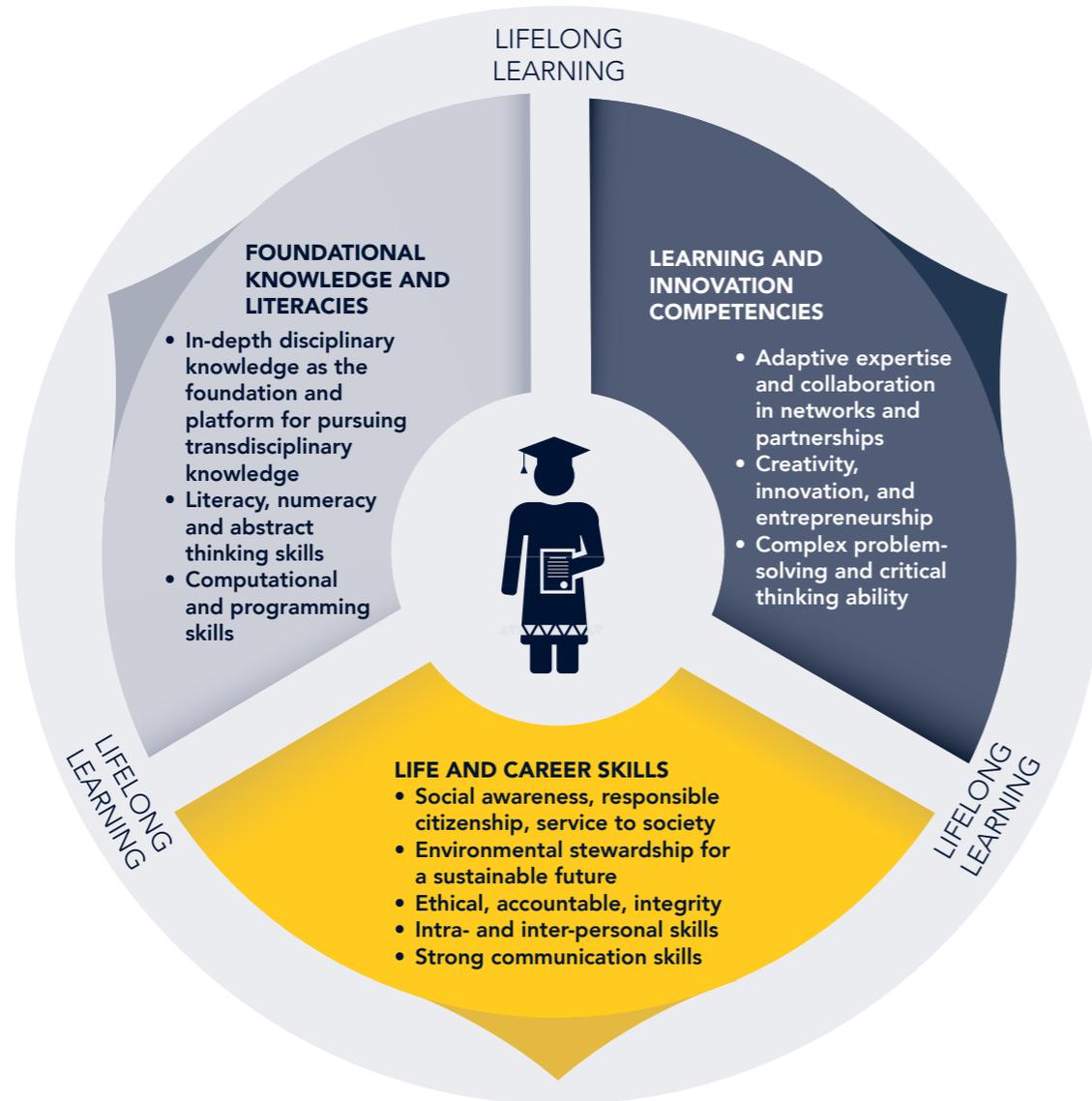
# Creating A 21st Century African Faculty of Science



# STRATEGIC PRIORITIES



# GRADUATE ATTRIBUTES



# STAFF ATTRIBUTES





## OUR VISION

To be a world-class engaged and transdisciplinary African Faculty of Science that responds to socio-economic and environmental challenges in society.

## OUR MISSION

To offer a diverse range of **life-changing** pure and applied science-based learning, teaching, research, training, innovation, engagement and transformational experiences, which develop excellent graduate and staff attributes for **sustainable futures**.

### VALUES

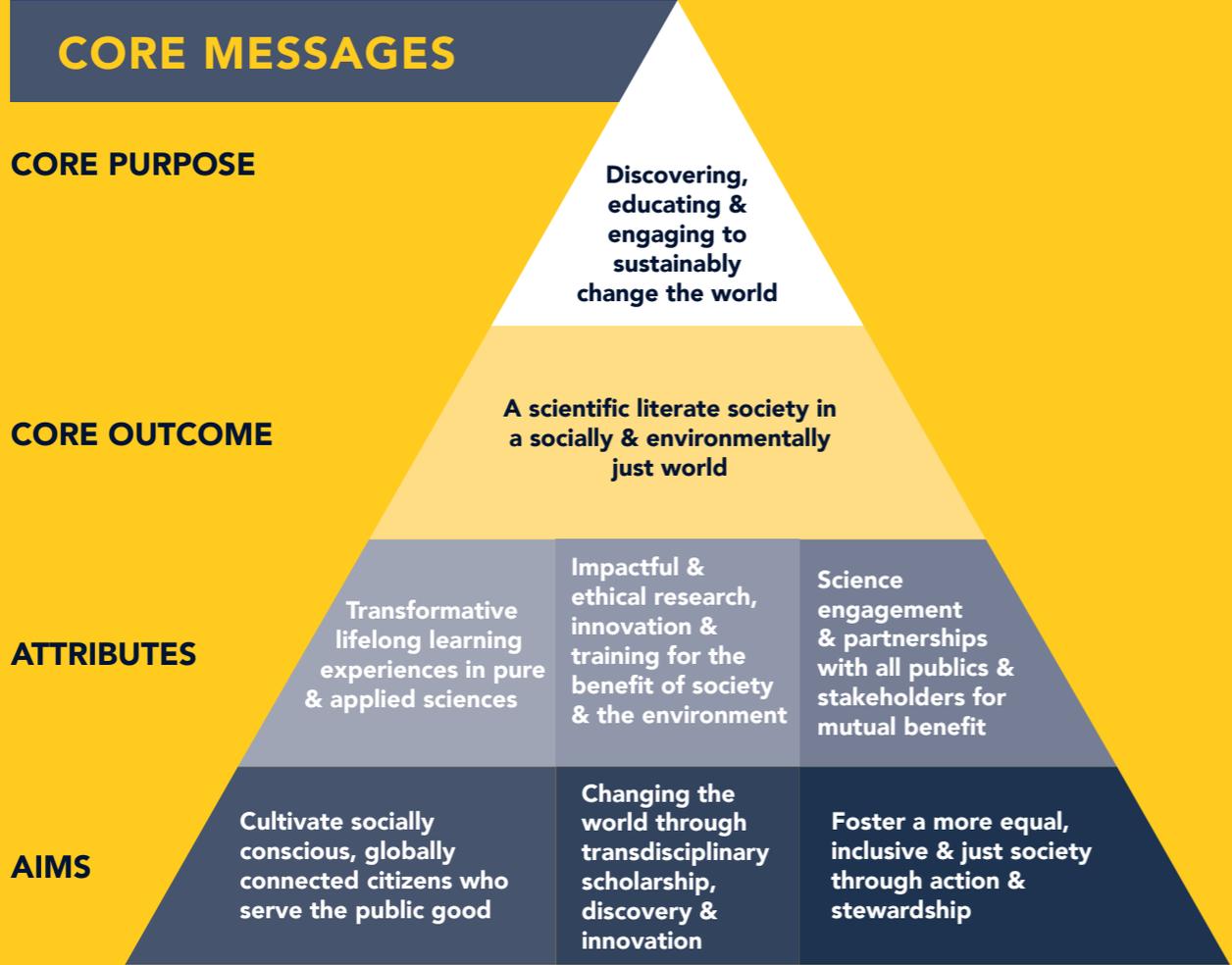
- Diversity
- Integrity
- Excellence
- Environmental Stewardship
- Ubuntu
- Responsibility
- Social Justice and Equality
- Safety and Wellness

## CORE FOCUS

**PHILOSOPHY & PRINCIPLE**  
Strength in Diversity, Equity and Inclusion in Science

We are striving to be a sustainable, ethical, engaged and transdisciplinary **21st century African Faculty of Science** in the service of society

**BRAND PROMISE**  
Discovering, Educating, and Engaging to Change the World



**STRATEGIC FOCUS AREAS**



## STRATEGIC FRAMEWORK

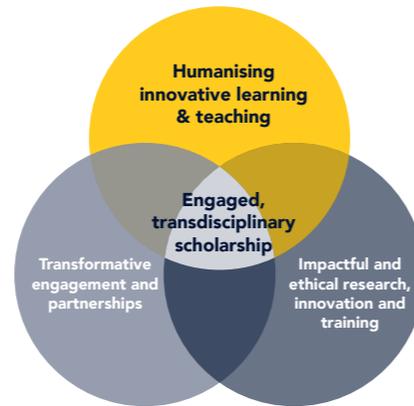
### VISION

To be a world-class engaged and transdisciplinary African Faculty of Science that responds to socio-economic and environmental challenges in society.

### MISSION

To offer a diverse range of life-changing pure and applied science-based learning, teaching, research, training, innovation, engagement and transformational experiences, which develop excellent graduate and staff attributes for sustainable futures.

### STRATEGIC FOCUS AREAS



### STRATEGIC ENABLERS



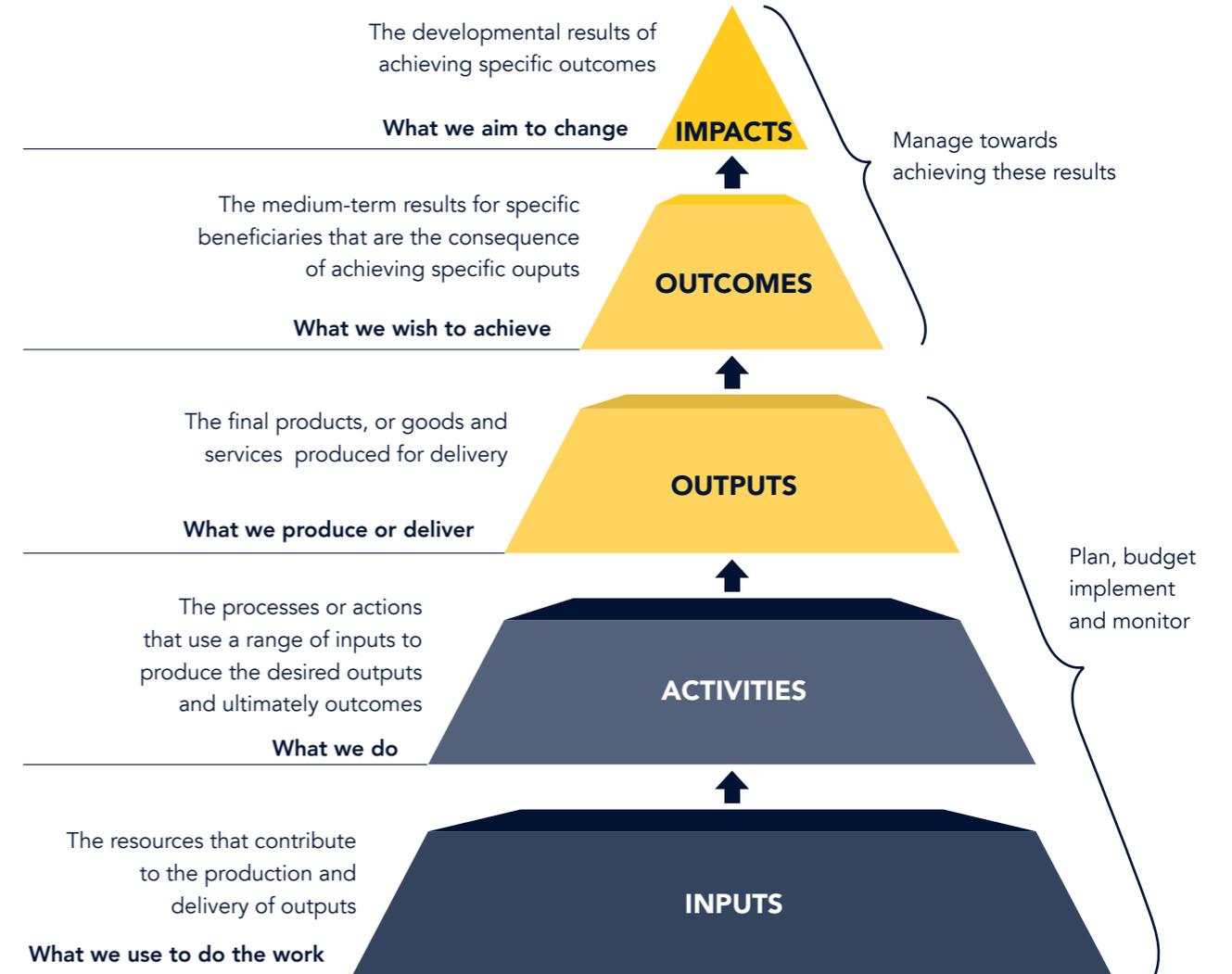
### FOUNDATIONAL VALUES



### GRADUATE ATTRIBUTES



## KEY PERFORMANCE INFORMATION CONCEPTS



The above will guide the Faculty when it crafts its Strategic Implementation Plan

Source: <http://www.treasury.gov.za/publications/guidelines/SP%20APP%20Framework.pdf>



# Positioning our University as a Leader in Sustainability Sciences

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**N**elson Mandela University is on a drive to position itself as a higher education leader in Sustainability Sciences, aligned with the Faculty of Science's Strategy 2030. The aim is to enhance collaboration and transdisciplinary research, with an associated increase in impactful research and outputs.

The basis for this orientation is that the current injudicious use of natural resources is unsustainable. We are compelled to take a different look at ourselves and our planet and how to sustainably manage all life here.

## THE Impact Rankings

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Nelson Mandela University participated in the Times Higher Education (THE) Impact Rankings for the first time in 2021. These are global performance tables that assess universities' contribution to the SDGs.

In 2021, the University was recognised for its strengths in addressing SDG 3: Good Health and Wellbeing; SDG 14: Life Below Water; SDG 15: Life on Land; and SDG 17: Partnerships for the Goals. The strongest ranking was Life Below Water – 40th globally – and we were the only university in South Africa to rank in this SDG. For partnerships, we ranked highest in South Africa, together with the University of Cape Town and the University of Pretoria.

In 2022, our second year of participation in the THE Impact Rankings, our best performance was in SDG 14: Life Below Water. With a score of 73.7 out of 100, Nelson Mandela University achieved a worldwide ranking of 69th out of 452 participating institutions and was ranked first in South Africa for this SDG. In addition, the University was ranked second in South Africa for SDG 13: Climate Action and SDG 15: Life on Land.

The University is committed to addressing the sustainability challenges faced by our country, continent and world. The goal is to improve on and add to the rankings in the Strategy 2030 period and beyond.

# The Scientific Case for Academic Clusters and Academic Streams

**S**trategy 2030 includes the reorganisation of the Faculty of Science into six academic clusters, instead of schools. This change enables the Faculty to realign its focus towards Sustainability Sciences, the Fourth and Fifth Industrial Revolutions and Community Engagement.

Six Academic Clusters:

- Life, Earth, Environmental and Agricultural Sciences (LEEAS)
- Physical Sciences
- Mathematical and Computational Sciences
- Biosciences and Biotechnology
- Natural Resource Science and Management (George Campus)
- X-Stream

We clustered departments, entities and programmes according to their broader disciplines and similarity in character. The advantage of academic clusters is that they foster an integrated approach to learning and teaching, research and innovation, engagement, and governance, aimed at improving Faculty planning and functioning, decision-making, streamlining, and the effective implementation of Strategy 2030.

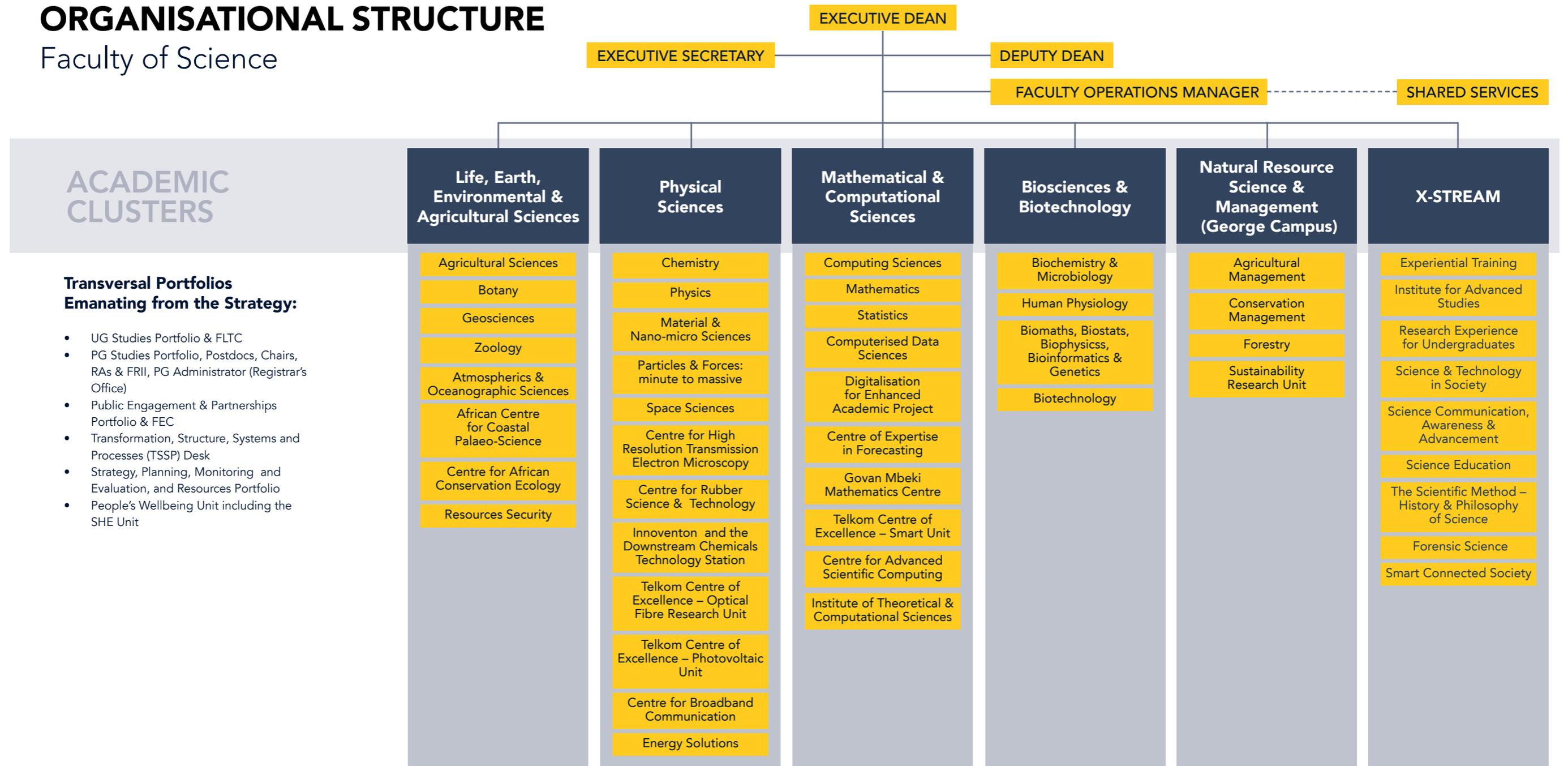
In each of the academic clusters we have academic streams that guide Faculty of Science students towards multiple opportunities and career paths, shaped by Strategy 2030, global megatrends and the local context.

As part of this process, several new relevant programmes have been added, including Resources Security, Energy Solutions and a new X-Stream cluster, which will include an Institute for Advanced Studies that will incorporate Advanced Sustainability Sciences Studies.



# ORGANISATIONAL STRUCTURE

## Faculty of Science



## Life, Earth, Environmental and Agricultural Sciences (LEEAS)

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This cluster focuses on the interaction between the Earth, its water, air and living organisms, and on the dynamic interdependent relationships between these four components.



## Physical Sciences

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Physical Sciences is part of the South African schooling system curriculum, and first year students are therefore familiar with this discipline. This cluster is the foundation on which the Natural Sciences, Engineering, Technology and Innovation are built. They form part of the Basic Sciences.

## Mathematical and Computational Sciences

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Mathematical and computational sciences are members of the Basic Sciences, together with Physical and Life Sciences. This cluster ranks first in terms of servicing the majority of students from all the other faculties. It plays a critical role in Computational and Data Sciences and in the Digitalisation Unit of the Faculty which assists with technology-enhanced Learning & Teaching, Research, Training and Innovation, and Engagement. This cluster is the 'language' of the Faculty and the home of the 4IR and 5IR. Importantly, it services all the other clusters, streams, disciplines, programmes, and entities.

## Biosciences and Biotechnology

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This cluster is focused on growing and developing the study of biological systems using the knowledge of the Basic Sciences and Technology.

## Natural Resource Science and Management (George Campus)

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The focus of the cluster is on the Sustainability Sciences, drawing on the transdisciplinary science knowledge within each programme.

## X-Stream

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Strategy 2030 and the Faculty's Core Ideology supports the X-disciplinary approach (inter-, multi, cross- and transdisciplinary) in the creation of the X-Stream so that it becomes endemic to the academic culture. This stream includes creating the necessary conditions for a culture of engagement and citizen science to thrive in the Faculty. It promotes Science Education and Science Education Research; it establishes research experience for undergraduates and advances postgraduate research. It proactively develops the Faculty brand and the Science Communication, Awareness and Advancement unit. It expands and advances partnerships with local, national, African and international stakeholders to strengthen the Faculty's footprint; and embeds cultural, socio-economic and environmental stewardship as a Faculty culture and practice.

# Strategic Priorities and Goals

## 1. Learning and Teaching (L&T)

By 2030 we aim to achieve the following:

To be learning and teaching from a 21st century, Africa-purposed science curriculum that responds to socio-economic and environmental challenges.

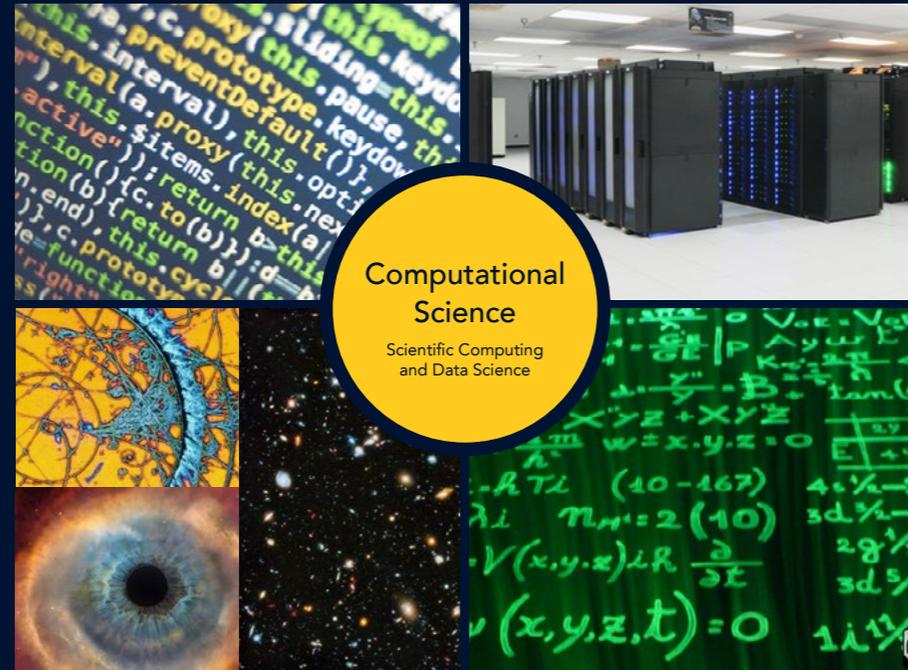
### Strategic Goals (SGs) for Learning and Teaching

- SG 1 Expand, renew and Africanise the curriculum to make it relevant and responsive.
- SG 2 Understand our students so that we can learn how to facilitate their success and create a Learning & Teaching (L&T) environment that enables them to succeed.
- SG 3 Create an environment that enables L&T staff (including laboratory assistants, technicians, tutors and demonstrators) to succeed.
- SG 4 Embed the use of technology to enhance L&T in order to move towards completely blended L&T.
- SG 5 Create a culture of scholarship of L&T (Science Education Research, and Engagement)
- SG 6 Promote and protect the Basic Sciences.

This will be achieved through the following Strategic Activities:

- Digitalisation and modernisation of our learning and teaching spaces
- Renewal of the curriculum content, which will be locally relevant and global influential, and inclusive of diverse knowledges
- Embedding the Faculty and institutional values in the curriculum
- Inclusion of the graduate attributes metric in the curriculum, the annual and five-year reviews and curriculum assessments
- Streamlining of diverse programme offerings and articulation routes





## The 21st Century Academic

The current era requires a diverse academic profile, which, in turn, contributes to diverse opinions about the changing culture of academia. These demographic and cultural changes yield rich student outcomes and create an enriched academic environment that prepares our students for the skills requirements, jobs and self-employment opportunities of the future. Coupled with this, Nelson Mandela University is focused on entrepreneurship education and online and hybrid technology-assisted education.

### WHO WE TEACH

The question of who we teach talks to conducive environments, methods and pedagogies. It involves the cultures, philosophies, ideologies, values, beliefs, histories, societies, and, very importantly, the contexts of our students and staff.

Academics are facilitators of diverse knowledge, helping students to approach, assimilate and work out how to use this knowledge.

## 2. Research, Training, and Innovation (RTI)

By 2030 we aim to achieve the following:

World-class, cutting-edge research outputs and innovation, and student-centric training that is locally and Africa-focused, as well as globally impactful and competitive.

### Strategic Goals (SGs) for Research, Training, and Innovation

- SG 1 Grow pure and applied research excellence, knowledge and outputs.
- SG 2 Improve the local, national and international research profile of the Faculty.
- SG 3 Strengthen basic/fundamental research and promote scientific progress.
- SG 4 Postgraduate and postdoctoral research development and innovative undergraduate teaching.
- SG 5 Develop a culture of innovation and entrepreneurship.

**This will be achieved through the following Strategic Activities:**

- Cultivation of a scientifically inquisitive culture
- Creating the space and time for research innovation and entrepreneurship within the Faculty's workload model
- Creating common spaces and an environment for transdisciplinary research and collaboration to flourish
- Institutionalising the undergraduate research programme within the Faculty
- Institutionalising postgraduate student structures
- Establishing forums as precursors of future programmes in the Faculty Strategy
- Establishing a database of research collaborators and partners and an ongoing process of attracting new research collaborators and partners
- Growing new niche areas that advance blue sky research and respond to socio-economic and environmental challenges



## Frontiers of the Basic Sciences

The United Nations Educational, Scientific and Cultural Organization (UNESCO) has highlighted that the basic sciences are being neglected worldwide. There is a global call for the protection and promotion of the basic sciences, including the biological sciences, chemistry, physics, mathematics, statistics, computer science, and the geological sciences (clustered broadly as mathematical, physical, and life sciences). To understand the Earth and Universe's complex systems requires a solid foundation in the basic sciences.

Strategy 2030 focuses on the promotion, protection and resourcing of the basic sciences to give scientists the time and space to develop groundbreaking, curiosity-driven ideas that lead to major breakthroughs. This sometimes take decades and we need to stop forcing our scientists to constantly come up with solutions now.

As part of supporting curiosity-driven research, the Faculty is working to establish the Institute for Theoretical and Computational Sciences. Curiosity-driven research in the basic sciences has produced fundamental transformation in the last approximately 150 years, such as quantum mechanics, genomics, antibiotics, plate tectonics, nuclear fission and fusion, the x-ray, and the theory of evolution.

There is a virtuous symbiosis in which technology helps to push the boundaries of science while scientific breakthroughs open the way to entirely new technologies. True technological innovation often relies on the purest of curiosity-driven science, in the least predictable ways. The fruits of curiosity-driven research into the unknown have often been magnificent.

### 3. Engagement and Partnerships

**By 2030 we aim to achieve the following:**

An engaged, 21st century African Faculty of Science

#### Strategic Goals (SGs) for Engagement and Partnerships

SG 1

Create the necessary conditions for a culture of engagement to thrive in the Faculty of Science.

SG 2

Develop knowledge and skills exchange between the Faculty of Science, our partners, stakeholders and wider society.

SG 3

Develop the Faculty brand, and expand and advance partnerships with local, national, African and international stakeholders to strengthen the Faculty's footprint.

SG 4

Embed cultural, socio-economic and environmental stewardship as a Faculty culture and practice.

SG 5

Integrate engagement into L&T and research within the Faculty of Science to improve citizen science scholarship.

#### This will be achieved through the following Strategic Activities:

- Embedding the science engagement metric in staff performance appraisals, students' portfolios, students' graduate attributes, and the curriculum
- Establishing spaces in the community where stakeholders and Faculty meet
- Creation of a new Faculty brand that promotes the Strategy
- Embedding Science Engagement into the Learning & Teaching and Research & Innovation spaces
- Championing of Science for Society as a driving focus of the Faculty



Image: Dr Stephanie Plön

### The Blue Economy

The South African government is significantly investing in Operation Phakisa for the 'Blue Economy', in which the ocean sciences play a key role. The Faculty of Science is substantially involved in the Ocean Sciences Campus and its programmes. We are not only interested in the research side; we are also interested in capacity building, through the creation of an ocean sciences stream within our diverse faculty programme offerings.

## 4. Resource Stewardship

By 2030 we aim to achieve the following:

A sustainable Faculty of Science.

Strategic goals (SGs) for Resource Stewardship

- SG 1 Strategically manage and sustainably grow Faculty infrastructure.
- SG 2 Optimise the size and shape of the Faculty.
- SG 3 Provide products, services, solutions and skills in support of digitalisation.
- SG 4 Strategically manage and sustainably grow the income streams.
- SG 5 Optimise human resources in support of the size and shape, and the strategic objectives of the Faculty.

This will be achieved through the following Strategic Activities:

- Strategically mapped out avenues that the Faculty can leverage to sustain itself through collaborations, partnerships and participation in large scientific projects
- Management, maintenance and modernisation of resources with a focus on multipurpose, smart infrastructure
- Entrenched digitalisation to optimise the size and shape of the Faculty within the University system
- Utilisation of the Faculty's resources and skills to boost existing income streams and generate additional ones
- Maximisation of tools, space and time
- Ongoing investment in human capital and advancement opportunities for staff as part of attraction and retention





Image: South African Radio Astronomy Observatory (SARAO)

## Major Scientific Projects

Nationally and internationally the Faculty is focused on the big scientific projects, and developing our research chairs to be of national and international interest, such that academics, postgraduates and students from South Africa and internationally come to Nelson Mandela University to be part of them.

One of the biggest scientific projects in South Africa today is the Square Kilometre Array (SKA), which is venturing into new areas of studying the universe that other scientific instruments have not been able to access. As the host of the majority of the SKA dishes, this is where South Africa and its Department of Science and Innovation has committed to investing.

Participating in the SKA is requisite to being part of future scientific discoveries.

At Nelson Mandela University, we are developing niche SKA-related transdisciplinary research, from engineering to the basic sciences, and working futuristically in this regard by putting in the groundwork towards future discoveries.

## 5. Transformative Structures, Systems, and Processes

**By 2030 we aim to achieve the following:**

Transformative structures, systems and processes that enable and serve as catalysts in achieving the Faculty's Strategic Vision.

**Strategic goals (SGs) for Transformative Structures, Systems, and Processes**

- SG 1** Create a transformative culture that enhances diversity and inclusivity in the Faculty and upholds excellence.
- SG 2** Establish transformative systems, processes and policies that support, enhance and streamline academic, administrative and management functions within the Faculty.
- SG 3** To have an organisational structure that supports the strategic and transformational priorities of the Faculty.

**This will be achieved through the following Strategic Activities:**

- Digitalisation of the Faculty's systems and processes
- Annual reviews of the Faculty's structures to ensure they remain relevant and fit for purpose
- Annual reviews of Faculty policies, guidelines and processes
- Embedding of the principle of inclusivity, diversity, equity, and access for success (IDEAS)



## Emerging Fields and Transdisciplinary collaborations

The faculty encourages collaborations, and its approach is based on the philosophy of an in-depth disciplinary foundation coupled with multi- and transdisciplinary research, with a special focus on new niche areas and emerging fields. In all research areas we encourage our staff and postgraduate students to collaborate with peers at other universities, industry, governments and communities. National and international collaborations are enhanced by digital platforms. Co-supervision is very important in this regard and university systems need to accommodate joint programmes and postgraduate qualifications that can be awarded from two or more universities.

## 6. Students and Staff Access and Success

**By 2030 we aim to achieve the following:**

An accessible Faculty of Science that is recognised for its student and staff success.

**Strategic Goals (SGs) for Students and Staff Access and Success**

**SG 1** Provide an efficient and transparent process for access into the Faculty.

**SG 2** Provide access to a safe, secure, enabling, healthy environment for Faculty students and staff.

**SG 3** Provide an efficient process for student and staff progression within the Faculty.

**This will be achieved through the following Strategic Activities:**

- Development of mechanisms and processes that demonstrate the Faculty understands its students and staff
- Development of systems and processes that enable easy access to the Faculty
- Development of systems and processes that enable student and staff success

# Engagement is a core focus

As an engaged Faculty we:

- Embed public engagement in the way we approach our work;
- Have activities in place which incorporate public engagement in our research, knowledge exchange, teaching, and social responsibility;

There are several activities the Faculty is undertaking in this regard, such as engaging with the Department of Science and Innovation and the Eastern Cape Department of Education in an engagement strategy framework for science

outreach and science education, to nurture a culture of science and mathematics education. This very much includes the Eastern Cape's rural areas, such as our Cala, Mvezo and Cofimvaba projects, which combine mathematics, science and IT educational advancement programmes in the region's schools and communities.

## Science engagement

Science engagement includes all aspects of public engagement with science: science communication, science literacy and science outreach and awareness. The Faculty's science engagement strategy additionally focuses on partnerships with other higher education institutions, research and training facilities, industry relations and partnerships, African and international relations and partnerships.

## The Faculty is strategically partnering with the Department of Science

and Innovation (DSI) and the South African Agency for Science and Technology Advancement (SAASTA) in science communication activities.

The Faculty's primary strategic partner in addressing basic education challenges is Nelson Mandela University's Faculty of Education. We address the educational challenges through programmes from Grade R in the Foundation Phase all the way through to undergraduate level at university. We also engage with other faculties in programmes, such as "Art meets Science" with the Faculty of Arts.



## Science Communication in Society

**A**s a Faculty, our goal in embedding science communication within our curriculum is to be better teachers in the classroom and good communicators of our fields of study and research in our interactions with students, governments, industries, communities, journalists and citizens.

We need to clearly explain what we are doing and why, in a way that people get what we are saying, are interested in hearing more, and understand the importance of it. Science communication is a two-way engagement: there is so much that our Faculty learns from our villages and rural areas, opening doors for postgraduate research in a partnership of trust and mutual respect.

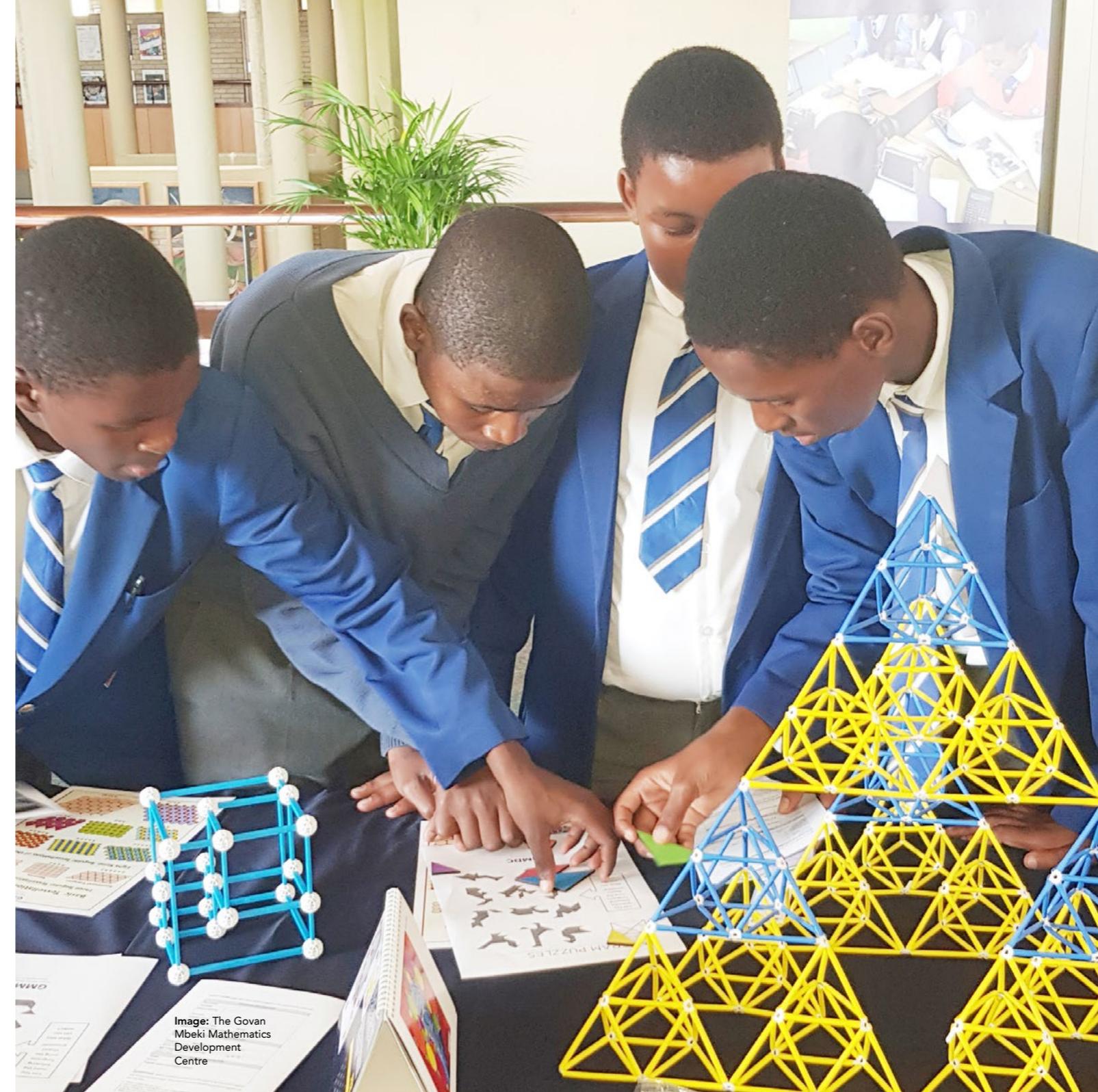


Image: The Govan Mbeki Mathematics Development Centre

# Looking to the Future

**T**he Faculty is forming an Institute of Theoretical and Computational Sciences to seize the opportunity of growing a niche area in big data as a fourth paradigm in research. Analysis of large volumes of complex data to derive knowledge will require data-driven computing.

As scientists the future is out there waiting for us to discover. It includes climate change, our biosphere, our demographics and the future of us as humans, which speaks to the future of medicine, genomics and genetic engineering, synthetic biology, and the future of the digital world. This includes artificial intelligence, quantum computing, the cloud, the internet of things and cyber security.



Content: Heather Dugmore  
Design: Juliana Jangara

# Change the World

"I have walked that long road to freedom. I have tried not to falter; I have made missteps along the way. But I have discovered the secret that after climbing a great hill, one only finds that there are many more hills to climb. I have taken a moment here to rest, to steal a view of the glorious vista that surrounds me, to look back at the distance I have come. But I can only rest for a moment, for with freedom come responsibilities, and I dare not linger, for my long walk is not ended"

– Nelson Mandela

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