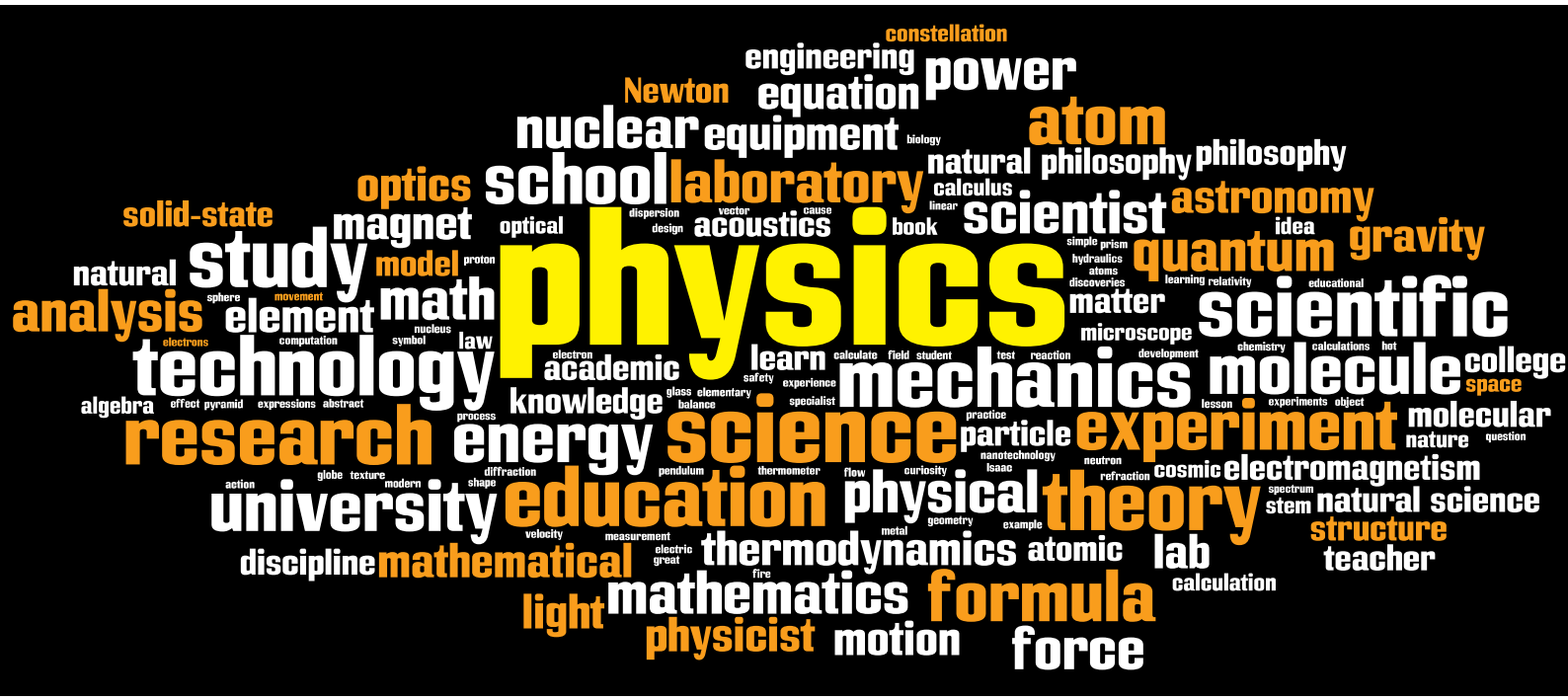
UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE

School of Chemistry and Physics



WHAT IS PHYSICS?

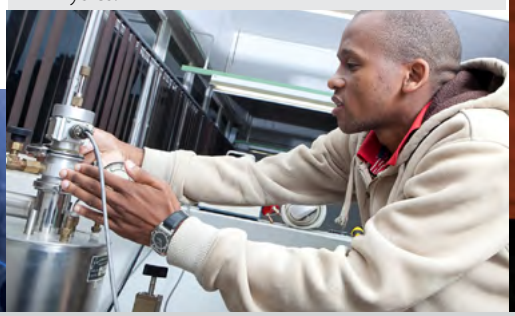
Physics is the scientific study of the universe from the smallest to the largest scale. It is about unravelling the complexities of the physical world around us to discover the way it is and how it works. Discoveries in physics have formed the foundation of many technological advances and these have played an important role in many scientific areas. Many techniques that underpin the technologies used in data storage, information processing, telecommunication, medical devices and imaging, nanotechnology and quantum computing are derived from physics. Even the idea of the world wide web was started as a spin-off from the information processing and communications requirements of high-energy physics. The contributions of physics to solving global problems such as energy production, pollution control and environmental protection, global warming and public health are essential, and these have an enormous impact on our society.

WHAT IS THE HONOURS DEGREE IN PHYSICS?

The honours degree in physics is a one-year study program focused on intermediate-level physics. Postgraduate courses are offered at NQF level 8 to bring you to the threshold of current research, and these can lead to subject specialism in experimental, theoretical and computational research. As an honours physics student at UKZN, you will have access to a dedicated lecture facility and teaching laboratory. The teaching programs and their accompanying tutorials give students direct and regular access to physicists who are actively involved in research, and this will provide you an opportunity to explore scientific ideas with experts in the diverse fields on offer.

WHY SHOULD YOU STUDY FOR AN HONOURS DEGREE IN PHYSICS?

This degree will be of interest to those who seek a deeper understanding of the basis of physics and who want a degree that can qualify them to enrol in the Master's degree program in Physics. In the Honours physics course, some of the physics modules will cover topics that underpin current research. The course is also intended to equip those who take it with the ability to think scientifically, to handle difficult concepts and to present their conclusions incisively and effectively. It is a degree course which aims to bridge the basic and advanced scientific divides in Physics.



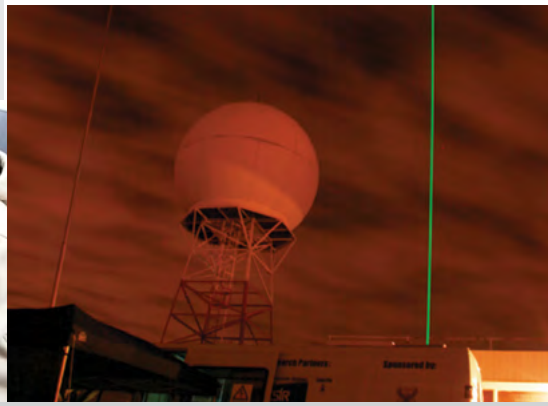
WHAT ADVANTAGES WILL YOU HAVE WITH A POSTGRADUATE DEGREE IN PHYSICS

You can specialize in an area of your interest whether theoretical, computational, or experimental.

Your quantitative reasoning and analytical problem solving skills will be strengthened.

You will be able to work in the public or private sector.

You will learn how to conduct scientific research and communicate your findings effectively.



PHYSICS @ WESTVILLE

WHY STUDY PHYSICS HONOURS AT UKZN WESTVILLE?

We offer a thorough training in the core areas of physics and in advanced topics.

Physics Westville has unique expertise and Honours courses in cosmology, space physics, atmospheric physics, quantum computing/machine learning, quantum optics of structured light fields, magnetic materials and nanophysics.

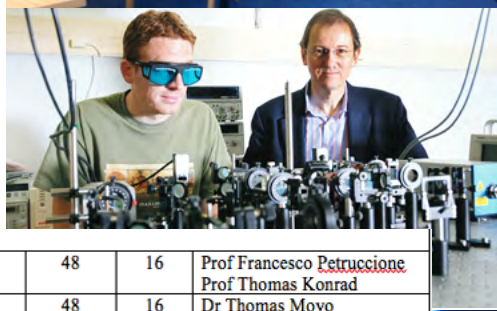
Moreover, we host strong applied physics and teach photonics and energy systems at Honours level with relevant links to industry.

PROFILE OF PHYSICS @ WESTVILLE

20 Staff and Postdocs		
15 PhD students	25 MSc students	8 Honours students

RESEARCH GROUPS

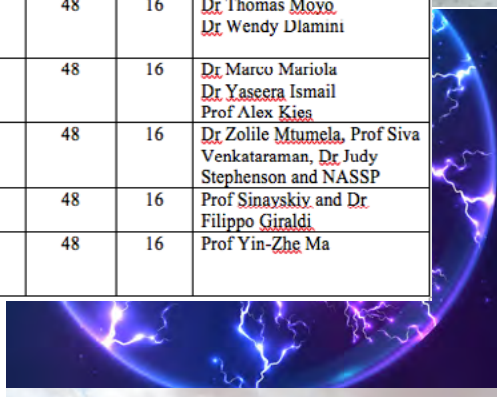
- Astro Physics
- Space Physics
- Atmospheric Physics
- Energy systems
- Photonics
- Nanoscience and Nanotechnology
- Condensed Matter Physics
- Quantum Information Processing and Communication



COURSE OUTLINE

Code	Title	Lectures	Credits	Lecturer
Year-long				
PHYS735 (CORE)	Project	Nil	32	Project supervisor
First Semester				
PHYS701 (CORE)	Classical Field Theory Part 1: Electrodynamics Part 2: Relativity	48	16	Prof Siva Venkataraman Prof Francesco Petruccione
PHYS702 (CORE)	Quantum Mechanics Part 1: Foundations Part 2: Applications	48	16	Prof Thomas Konrad Dr Ilya Sinayskiy
PHYS703 (CORE)	Classical Mechanics Statistical Mechanics	48	16	Prof Alex Kies Dr Mervlyn Moodley
PHYS736 (CORE)	Mathematical Methods Computational Physics	48	16	Prof Ilya Sinayskiy Dr Alan Matthews

Second Semester				
PHYS737	Advanced Topics in Quantum Mechanics	48	16	Prof Francesco Petruccione Prof Thomas Konrad
PHYS738	Advanced Topics in Condensed Matter Physics	48	16	Dr Thomas Moyo Dr Wendy Dlamini
PHYS739	Advanced Topics in Applied Physics	48	16	Dr Marco Mariola Dr Yaseera Ismail Prof Alex Kies
PHYS722	Advanced Topics in Space Science	48	16	Dr Zolile Mtumela, Prof Siva Venkataraman, Dr Judy Stephenson and NASSP
PHYS723	Advanced Topics in Plasma Physics	48	16	Prof Sinayskiy and Dr Filippo Giraldi
PHYS725	Advanced Topics in Astronomy and Astrophysics	48	16	Prof Yin-Zhe Ma



CREDITS

- Need a minimum of 128 credits to pass the course
- Core modules make up 96 credits
- Remaining 32 credits are from 6 elective modules (16 credits each)
- Up to 32 credits may be taken in another school, eg. Maths
- Selection of modules mainly in Semester 2

PROJECTS (experiment, theory, observational)

Do your first one-year research project in an exciting field:

- Space Weather
- Plasma Physics
- Astronomy and Cosmology
- Atmospheric Physics
- Quantum Information Processing and Communication
- Energy Systems
- Photonics
- Nano-technology

APPLICATION & CONTACT

PHYSICS HONOURS COORDINATOR AND ACADEMIC LEADER (WESTVILLE)
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PHYSICS HONOURS SECRETARY
Mrs Kerry-Ann Jordan
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Email: JordaanK@ukzn.ac.za or scp@ukzn.ac.za

INTERNAL APPLICANTS CLICK HERE **EXTERNAL APPLICANTS** CLICK HERE

APPLY BEFORE THE 30 SEPTEMBER 2021

INSPIRING GREATNESS