Stellenbosch UNIVERSITY IYUNIVESITHI UNIVERSITEIT

Science
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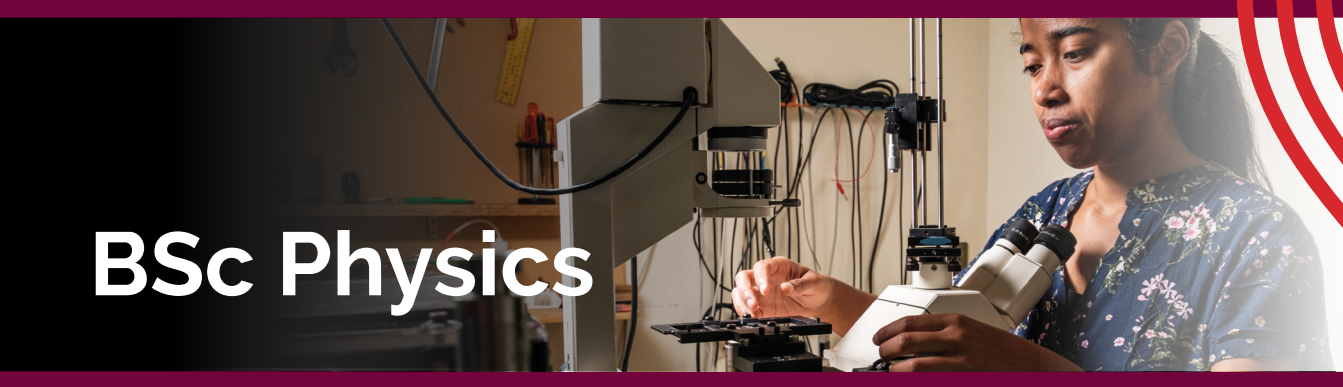
Natuurwetenskappe



BSc Physics

This programme provides training to develop well-rounded physicists with the technical and specific scientific skills required to make a unique contribution in research and development environments where physics-related problems are investigated. Take note of the different majors in the three focal areas in this programme:

Focal areas	Major/s
Laser Physics (Physical), Nuclear Physics, Radiation and Health Physics	Physics & Applied Mathematics OR Chemistry OR Computer Science OR Mathematics
Laser Physics (Biological)	Physics & Biochemistry
Theoretical Physics	Physics & Applied Mathematics OR Computer Science OR Mathematics

NB: Consult the Faculty of Science Yearbook for detailed information on subjects and modules.

Do I qualify?

Minimum admission requirements

- A NSC Aaverage of **65%** (excluding Life Orientation): **65%**
- English OR Afrikaans (Home Language or First Additional Language):**50%**
- Maths: **70%**
- Physical Sciences: **50%**

Focal areas explained:

Laser Physics (Physical), Nuclear Physics, Radiation and Health Physics

Experimental physicists are required in industry and in research and development environments. As a laser physicist you are equipped to participate in various metrological applications which use light and light-matter interactions, ranging from remote trace gas detection to diagnostic techniques in medicine, qualitative analysis, and communication. Institutions such as the Council for Scientific and Industrial Research (CSIR), the National Metrology Institute of South Africa (NMISA), Sasol, the defence and industry require these skills.

As a radiation physicist you can work as a hospital physicist or as a radiation control official with organisations that monitor radiation risks, such as the Department of Health, nuclear power stations, and mines.

As a nuclear physicist you can work in environments where techniques in nuclear physics are applied. Such environments include industries and institutions like Sasol, Eskom, the South African Nuclear Energy Corporation (NECSA), the National Nuclear Regulator (NNR), the South African Bureau of Standards (SABS) and the CSIR.

Laser Physics (Biological)

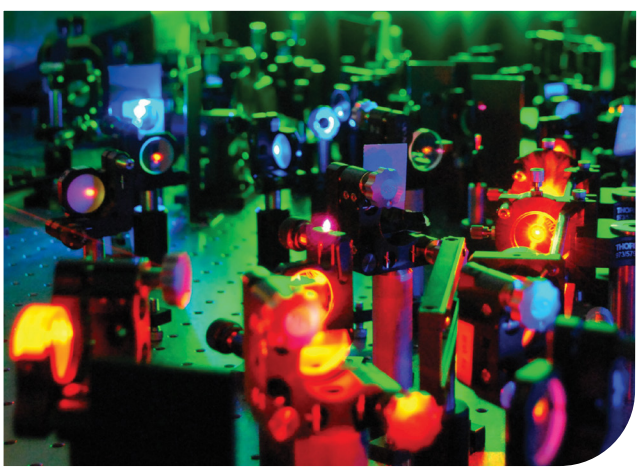
Because of the rapid increase in the use of lasers in medical and biological fields, there is a worldwide need for trained physicists with expertise in optics, lasers, and laser applications in the field of biology and medicine. Lasers provide innovative solutions over a wide front benefitting humanity. In medicine, lasers are used to correct vision, heal eye disorders that may cause blindness, treat skin diseases and to do surgery. Microscopic techniques using lasers have become commonplace in medical applications. New materials and medicines that are activated by laser light are developed.

Theoretical Physics

Students are prepared for research in the field of complex systems and for the application of quantum field theory, for instance in condensed matter physics, the physics of biological systems and particle physics. General relativity, astrophysics and cosmology are also active research areas within the department. Postgraduate study will prepare you for a professional career as a theoretical physicist. The curriculum is focused on physics and mathematics, requiring advanced computer skills.

Why study Physics?

- Physics forms the foundation of many other disciplines such as chemistry, astronomy, climate studies, the study of earthquakes, forensic sciences, and mechanical, civil, and electrical engineering.
- Physics principles are also applied in the biological and medical sciences.
- Physics teaches you critical analytical and problem-solving skills that can be applied to a wide range of fields – from the space industry to the financial world and risk analysis.
- Physics is listed as a scarce skill, which means there are not enough qualified physicists in South Africa!



Why study Physics at Stellenbosch University?

- The Department of Physics, established in 1903, is one of the oldest physics departments in South Africa.
- The Stellenbosch Photonics Institute boasts excellent laser facilities, world-class research projects, and a vibrant community of students, lecturers, and technical staff.
- Our nuclear physicists work closely with their counterparts at Ithemba LABS, the national accelerator facility located just outside Stellenbosch.
- Our astrophysicists are actively working on the epoch of reionization, extragalactic astronomy, the early Universe, dark matter indirect detection, neutron stars and black holes.
- Our quantum physicists are engaged in research in quantum computing, communication and sensing.

What can I do with a BSc Physics degree?

Astronomy and Astrophysics
Artificial intelligence
Atmospheric modeling
Aviation physicist
Biophysics
Data analysis
Data science
Experimental physics
Financial analysis
Forensic physics
Geophysics
Laboratory director
Nuclear physics
Physical sciences teacher
Quantum computing, communication and sensing
Radiation protection practitioner
Risk management
Robotics

"A BSc degree will open doors to many opportunities. But, more importantly, it is a way of thinking that is critical to take humanity forward."

– undergraduate BSc student

Contact details

Department of Physics
Tel: (021) 808 3391
E-mail: physqueries@sun.ac.za
Website: www.su.ac.za/physics

Contact our Coordinator: Student and Academic Affairs

at scienceadmin@sun.ac.za

Deadline: Apply with your grade 11 marks by 31 July

General admission and selection criteria

www.su.ac.za/ugrequirements

Stellenbosch UNIVERSITY IYUNIVESITHI UNIVERSITEIT

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BSc Fisika

Hierdie program bied opleiding wat afgeronde fisici lewer met die nodige tegniese en spesifieke wetenskaplike vaardighede om 'n unieke bydrae te kan lewer tot navorsings- en ontwikkelingsomgewings waar fisika-verwante probleme ondersoek word. Neem kennis van die verskillende hoofvakke in die drie fokusareas van hierdie program:

Fokusareas	Hoofvakke
Laserfisika (Fisiese), Kernfisika, Stralings- en Gesondheidsfisika	Fisika en Toegepaste Wiskunde OF Chemie OF Rekenaarwetenskap OF Wiskunde
Lasersfisika (Biologiese)	Fisika en Biochemie
Teoretiese Fisika	Fisika en Toegepaste Wiskunde OF Rekenaarwetenskap OF Wiskunde

NB: Raadpleeg die nuutste Jaarboek van die Fakulteit Natuurwetenskappe (Deel 5) vir inligting oor vakke, modules, en spesifieke toelatingsvereistes.

Voldoen ek aan die vereistes?

Minimum toelatingsvereistes

- 'n NSS-gemiddeld van **65%** (Lewensoriëntering uitgesluit)
- Engels OF Afrikaans (Huistaal of Eerste Addisionele Taal) **50%**
- Wiskunde **70%**
- Fisiese Wetenskappe **50%**

Fokusareas uiteengesit:

Laserfisika (Fisiese), Kernfisika, Bestralings- en Gesondheidsfisika

Eksperimentele fisici word benodig in die industrie en in navorsings- en ontwikkelingsomgewings word toegerus om deel te neem aan verskeie metrologiese toepassings wat lig en lig-materie-interaksies gebruik, wat wissel van die identifisering van lae konsentrasies gas oor 'n afstand, tot diagnostiese tegnieke in geneeskunde, kwalitatiewe analise, en kommunikasie. Instellings soos die Wetenskaplike en Nywerheidnavorsingsraad (WNNR), die Nasionale Metrologiese Instituut van Suid-Afrika, Sasol, verdediging en die industrie benodig hierdie vaardighede.

As 'n stralingsfisikus kan jy as 'n hospitaalfisikus werk of as 'n bestralingsbeheerbeampte by organisasies wat bestralingsrisiko's monitor, soos die Departement van Gesondheid, kernkragstasies, en myne.
As 'n kernfisikus kan jy in omgewings werk waar tegnieke in kernfisika toegepas word. Sulke omgewings sluit nywerhede en instellings soos Sasol, Eskom, die Suid-Afrikaanse Kernenergiekorporasie, die Nasionale Kernkragreguleerder, die Suid-Afrikaanse Buro vir Standaarde, en die WNNR in.

Laserfisika (Biologiese)

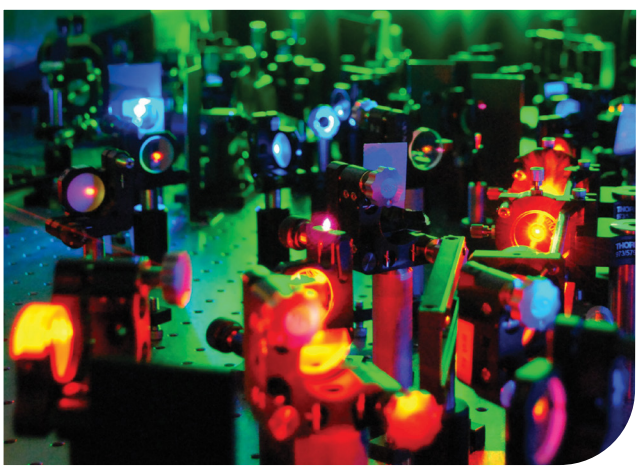
Weens die vinnige toename in die gebruik van lasers in mediese en biologiese velde, is daar wêreldwyd 'n behoefte aan opgeleide fisici met spesialiskennis in optika, lasers en lasertoepassings op die gebied van biologie en die geneeskunde. Lasers verskaf innoverende oplossing oor 'n spektrum tot voordeel van die mensdom. In geneeskunde word lasers gebruik om visie reg te stel, om oogsiektes te genees wat blindheid kan veroorsaak, om velsiektes te behandel en chirurgie te doen. Mikroskopiese tegnieke wat lasers gebruik, het algemeen geword in mediese toepassings. Nuwe materiale en geneesmiddels wat deur laserlig geaktiveer word, word ook nou ontwikkel.

Teoretiese Fisika

Studente word voorberei vir navorsing in die veld van komplekse sisteme en vir die toepassing van kwantum-veldteorie, byvoorbeeld in gekondenseerde materie-fisika, die fisika van biologiese sisteme en deeltjiefisika. Algemene relatiwiteit, astrofisika en kosmologie is ook aktiewe navorsingsareas in die departement. Nagraadse studie sal jou voorberei vir 'n professionele loopbaan as teoretiese fisikus. Die kurrikulum is gefokus op fisika en wiskunde en vereis gevorderde rekenaarvaardighede.

Waarom BSc Fisika studeer?

- Fisika vorm die grondslag van baie ander dissiplines soos chemie, sterrekunde, klimaatstudies, die bestudering van aardbewings, forensiese wetenskappe, en meganiese, siviele en elektriese ingenieurswese.
- Fisika-beginsels word ook in die biologiese en mediese wetenskappe toegepas.
- Fisika leer jou kritiese analitiese, en probleemoplossings-vaardighede wat op 'n wye reeks velde toegepas kan word – van die ruimte-industrie tot die finansiële wêreld en risiko-analise.
- Fisika word as 'n skaars vaardigheid gelys – wat beteken daar is nie genoeg gekwalifiseerde fisici in Suid-Afrika nie.



Waarom Fisika by die Universiteit Stellenbosch studeer?

- Die Departement Fisika wat in 1903 gestig is, is een van die oudste fisika- departemente in Suid-Afrika.
- Die Stellenbosch Fotonika Instituut spog met uitstekende laserfasiliteite, wêreldklas navorsingsprojekte, en 'n lewendige gemeenskap van studente, dosente, en tegniese personeel.
- Ons kernfisici werk nou saam met hul eweknieë by IThemba LABS, die nasionale versnellerfasiliteit net buite Stellenbosch.
- Ons astrofisici werk aktief aan die epog van herionisasie, ekstragalaktiese sterrekunde, die vroeë heelal, indirekte opsporing van donker materie, neutronsterre en swart gate.
- Ons kwantumfisici is besig met navorsing oor kwantumberekening, -kommunikasie en -waarneming.

Wat kan ek doen met 'n BSc Fisika-graad?

Astronomie
Astrofisika
Kunsmatige Intelligensie
Atmosferiese modellering
Lugvaartfisikus
Biofisikus
Data-analis
Datawetenskap
Eksperimentele fisika
Finansiële analis
Forensiese fisika
Geofisika
Laboratoriumbestuurder
Kernfisika
Fisiese Wetenskappe-onderwyser
Kwantumberekening, -kommunikasie en -waarneming
Bestralingbeskermingspraktisyn
Risikobestuur
Robotika

"Met 'n BSc-graad in Fisika, kry ek wetenskapskennis en die vermoë om dinge objektief en krities te analiseer, en ek leer hoe om hierdie kennis in die werklike lewe toe te pas".

– Voorgraadse BSc-student

Kontak ons

Departement Fisika
Tel: (021) 808 3391
E-pos: physqueries@sun.ac.za
Webwerf: www.su.ac.za/physics

Kontak ons Koördineerder: Studente- en Akademiese Sake

by scienceadmin@sun.ac.za

Sperdatum: Doen aansoek met jou graad 11-punte teen 31 Julie

Algemene toelatings- en keuringskriteria

www.su.ac.za/ugrequirements