



## Prof Danie Auret

Prof Auret is professor in die Departement Fisika in die Fakulteit Natuur- en Landbouwetenskappe. Hy gee onderrig in Termodinamika aan tweedejaar- BSc-studente en Elektroniese Materiale aan MSc-studente in sy navorsingsgroep. Prof Auret se navorsing is toegespits op halfgeleiermateriale en -toestelle, en hul toepassings. Die halfgeleiers wat sy groep ondersoek, sluit silikon (Si) en germanium (Ge) in wat gebruik word vir hoëspoed-rekenaars, en saamgestelde materiaal soos AlGaIn wat gebruik word in die vervaardiging van dagligblinde ultravioletligdetektors. In die besonder ondersoek hy die defekte in halfgeleiers wat toegeskryf kan word aan vervaardigingsprosesse, en die invloed van hierdie defekte op die gehalte van toestelle. Die gebreke word opgespoor deur middel van diepvlak-oorgangsspektroskopie, 'n tegniek wat dit moontlik maak om onsuiverhede en defekte op te spoor in konsentrasies van so laag as  $10^{10}$  per kubieke sentimeter. In prof Auret se navorsing word die stralingshardheid van halfgeleiers en die toestelle waarin hulle gebruik word ook ondersoek vir toestelle met toepassings in die ruimte – soos ultravioletsensore op satelliete of ruimtevaartuie.

Prof Auret en sy navorsingsgroep werk met talle groepe in die wêreld saam wat komplementêre navorsing doen. Die navorsing word grootliks befonds deur toekennings van die Nasionale Navorsingstigting (NNS) en deur owerheidsbefondsde bilaterale wetenskap- en tegnologiese ooreenkomste. Bilaterale projekte in samewerking met navorsingsgroepe in Frankryk, Swede, Duitsland, Pole en Noorweë is reeds suksesvol afgehandel. Hy lei tans 'n bilaterale projek in samewerking met navorsers in Bologna, Italië. Prof Auret dien op verskeie program- of advieskomitees vir internasionale konferensies, met inbegrip van die 27ste internasionale konferensie oor defekte in halfgeleiers (27th International Conference on Defects in Semiconductors 2013 – ICDS 27) wat in Julie 2013 in Italië plaasvind. Hy het die Universiteit van Pretoria se Toekenning vir Uitnemende Presteerders verskeie keer sedert 1992 ontvang. Hy beskik sedert 1993 oor 'n B1-gradering van die NNS en het in die Universiteit se Eeufeesjaar 2008 erkenning as een van UP se Denkleiers ontvang. Meer as 230 artikels deur hom het in ISI-gegradeerde vaktydskrifte verskyn, waarvan 47 in die afgelope vyf jaar. Hy was studieleier of promotor van meer as 40 graadse studente.

Prof Auret is a professor in the Department of Physics in the Faculty of Natural and Agricultural Sciences. He lectures Thermodynamics to second-year BSc students and Electronic Materials to MSc students in his research group. Prof Auret's research focuses on semiconductor materials and devices, and their applications. The semiconductors that his group investigates include silicon (Si) and germanium (Ge) used for high-speed computers, and compound materials like AlGaIn used in the fabrication of daylight-blind ultraviolet (UV) light detectors. In particular, he investigates the defects introduced into semiconductors in fabrication processes and the influence of these defects on device quality. The defects are characterised by deep-level transient spectroscopy, a technique capable of detecting impurities or defects in concentrations as low as  $10^{10}$  per cubic centimetre. In Prof Auret's research, the radiation hardness of semiconductors and the devices fabricated on them is also being investigated for device applications in space, such as UV sensors on satellites or space craft.

Prof Auret and his research group collaborate with numerous groups worldwide that perform similar or complementary research. The research is mainly funded by NRF grants and by government-funded bilateral agreements on science and technology. Bilateral projects have been successfully completed with research groups in France, Sweden, Germany, Poland and Norway. Prof Auret currently leads a bilateral agreement project with researchers in Bologna, Italy. He serves on several international conference programmes or advisory committees, including the 27th International Conference on Defects in Semiconductors 2013 (ICDS 27), taking place in Italy in July 2013. He has received the University of Pretoria's Exceptional Achievers Award several times since 1992, has been a NRF B1-rated researcher since 1993 and was recognised as one of UP's Leading Minds in 2008, the University's centenary year. He has published more than 230 papers in ISI-rated journals, of which 47 appeared during the past five years, and has supervised more than 40 postgraduate students.

Prof Auret ke moprofesa wa Kgoro ya Fisika ka Lefapheng la Thutamahlale a Temo le Tlhago. O ruta baithuti ba BSc ba ngwaga wa bobedi Themotaenamiks, le Dimetheriale tša Elektroniki go sehlopha sa dinyakišišo sa baithuti ba MSc. Dinyakišišo tša Prof Auret di beile šedi go dimetheriale le didirišwa tša disemikhondakthara (semiconductors) le tšhomišo ya tšona. Disemikhondakthara tšeo sehlopha sa gagwe se di nyakišišago di akaretša silikhone (Si) le Germaniamo (Ge) tšeo di šomišwago ka bokhomphutheng bja lebelo la godimo le dimetheriale tša dikhompaonte bjalo ka AlGaIn yeo e šomišwago ka ditatelano popong ya dihumanamabone a bogalegale le mosegare (UV). Gabotsebotse o nyakišiša dipošo tšeo di tsebagadišwego ka gare ga disemikhondakthara mo tatelanong ya popo le khuetšo ya tšona go boleng bja didirišwa. Dipošo di hlalošwa ke legato leo le tseneletšego la spektroskopi se sekopana seo e lego thekniki ya go kgona go lemoga dipošo ka tsitsinkelo ya bonnyane bjo e ka bago 10 ka sentimetara ya khubiki. Ka dinyakišišong tša Prof Auret tekanyetšo ya go tia ga disemikhondakthara le didirišwa tšeo di bopilwego go tšona di boela gape mo go tšhomišo ya didirišwa sebakabakeng, go swana le dikwi tša UV mo disathalaeteng goba diphatšamarung.

Prof Auret le sehlopha sa gagwe sa dinyakišišo ba šoma mmogo le dihlopha tše mmalwa go ralala le lefase tšeo di dirago dinyakišišo tšeo di swanago le tša bona goba di di tšaleletšago. Gantši dinyakišišo tšeo di thekgwa ka mašeng ke NRF le mmušo ka ditumelelano tša bašomišane ka ga saense le theknolotši. Diprotšeke tša tšhomommogo di phethilwe ke dihlopha tša dinyakišišo dinageng tše bjalo ka France, Sweden, Germany, Poland le Norway. Gabjale Prof Auret o etile pele protšeke ya tumelelano ya tšhomommogo le dinyakišišo ka nageng ya Bologna go la Italy. O šoma gape le mananeong a dikopanong tša boditšhabatšhaba goba dikomiting tša dikeletšo go akaretšwa Khonferentshe ya bo27 ya Boditšhabatšhaba ya Dipošo tša Disemikhondakthara ya 2013 (ICDS27) yeo e tla go swarelwa go la Italy ka Phupu 2013. O amogetše sefoka sa Radithuto wa go atlega go kudu wa Yunibesithi ya Pretoria go tloga ngwageng wa 1992; o bile monyakišiši wa maemo a B1 go tšwa go NRF go tloga ka ngwaga wa 1993, ebile o lemogilwe go ba yo mongwe wa ba Dikgopolo tša Dihlalefi ka 2008 e lego ngwaga wa bolekgolo wa yunibesithi. Prof Auret o gatišitše dipampiri tša go feta 230 ka ditšenaleng tša maemo a ISI gomme go tšona tše 47 di gatišitšwego mo mengwageng ye mehlang yeo e fetilego. O bile gape mohlalhi wa baithuti ba go feta 40 ba dithuto tša ka monago ga tikiri ya mathomo.