

## Scarce skills in photonics addressed through CSIR and UP partnership

In addressing the dire need of scarce skills in South Africa, the CSIR joined forces with the University of Pretoria (UP) to introduce a new [postgraduate degree](#) - a BEng (Hons) in photonics.

Lee Annamalai, manager of the CSIR's optronic sensor systems group, says, "I initiated a discussion with Professor Stef Roux at the UP in 2006, which stimulated significant interest and was also enthusiastically received by industry." He adds that his colleagues Nelis Willers and Dr Dirk Bezuidenhout spent significant time during 2007 in discussion with several stakeholders to work on the details.



Lee Annamalai, manager of the CSIR's optronic sensor systems group

He says this qualification will help address the skills shortage. "This is a highly focused intervention," he says. "We identified our weakness with respect to scarcity of skills, and developed a strategy that looks at the total human capital development (HCD) value chain. Our HCD strategy contains aspects from school level through to postgraduates." Annamalai says this programme is the postgraduate implementation of that strategy. "We aim to have a starting class of at least 10 students."

The UP's website states: "Due to a national shortage of highly qualified people with skills in optics and photonics, the CSIR, in consultation with local industry, requested the University of Pretoria to introduce a new postgraduate programme in optics and photonics. As a result, from 2008, eight new postgraduate modules for specialisation in optics and photonics, are provided under the BEng (Hons) programme in Electronic Engineering at the Department of Electrical, Electronic and Computer Engineering."

Asked why he decided on this qualification, Annamalai says optical engineering in South Africa was fairly mature, but there was a period of reduced investment and focus that resulted in a downward trend, especially in skills investment. Annamalai adds: "Few universities, and even fewer organisations are currently active in this field. We are trying to change that; globally, photonics is a growing sector, with many high-tech innovations and applications.

"Never before has there been such a proliferation of optical equipment. Examples include those used by the South African National Defence Force, the aerospace industry and commercial electronics - for instance DVD players, alarm systems, closed-circuit television, vehicle driver aids, cell phone cameras, even baby monitoring devices now make use of cameras and medical diagnostic instruments."

The photonics degree and other focused research groups at universities are playing a strong role towards augmenting the base on which the discipline is built. Annamalai says the programme focuses on optical engineering from classical optical design through to test and evaluation, and then system analysis and development with integration of electronics and mechanics - known as optomechatronics.

"For us," he says, "it's a major opportunity to fill our recruitment pipeline with relevant, skilled young graduates. Our researchers also have a chance to transfer knowledge through active participation in the programme, through lecturing, conducting practicals and guiding research projects. It has also provided a basis for us to liaise with other industry role players, as they would be beneficiaries of the HCD activities -

both by sending their employees onto the programme, and accessing students from the programme to work in their organisations."

CSIR optronic sensor systems will enable access to its facilities for practicals, developing and delivering courses, using its international network to create opportunities for visiting lecturers, guiding and proposing research project topics, vacation work opportunities for the students and facilitating interactions with industry.

Annamalai's long term objective is to get more qualified and skilled people to participate in the photonics industry, to create more capacity for research and to form new companies that can compete globally. "Many emerging economies are using photonics as an economic generating activity; we should grab the opportunity to participate," he says.

"We have discussed the possibility of opportunities for students at several different companies, like Denel Aerospace, Zeiss and SAAB Avitronics as the first partners. More information will be released when final strategies are in place," concludes Annamalai.

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