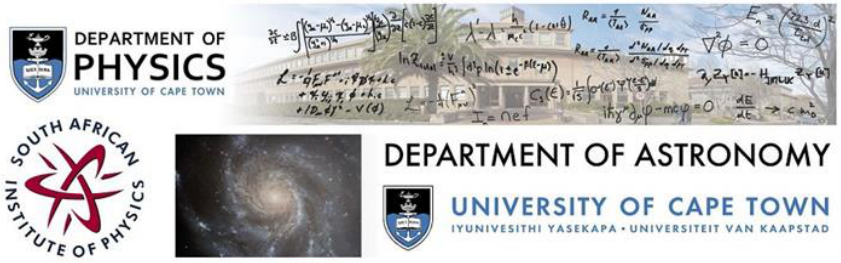

Contribution ID: **387** Type: **Oral Presentation**

Development of high-power and high-energy solid-state lasers and amplifiers

Friday, 8 July 2016 10:00 (20 minutes)

Abstract content
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An overview of laser source development at the CSIR National Laser Centre is presented.
A number of different laser sources, based on various architectures were developed to fulfill a diverse range of needs. These systems included ultra-compact short-pulse 1 micron lasers, Large Mode Area (LMA) mid-infrared fibre lasers, bulk solid-state lasers and amplifiers, as well as Optical Parametric Oscillators (OPOs).
The ultra-compact 1 micron lasers delivered multi-kW peak powers in nanosecond pulses at Pulse Repetition Frequencies (PRF) in excess of 100 kHz. This laser prototype was developed for use in ranging applications.
Development of 2 micron, high-power bulk lasers and amplifiers for use as OPO pump sources as well as free space propagation has also proven highly successful, culminating in the successful completion of a fieldable Ho:YLF laser and amplifier system, delivering up to 60 W of laser power in a near-diffraction limited beam.
We are also investigating mid-infrared parametric sources emitting in the 3 to 5 micron region. Sources in this wavelength region have applications in several fields, including medicine, optical communication, and defence. Results obtained thus far are very promising, with up to 14 W of output power demonstrated from a single-crystal OPO emitting at 4 micron.
In conclusion, we present our vision and future strategy for aiding both the South African Photonics research community as well as industry.

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