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SILVER MEDALLIST LECTURE: Manipulating Structured Light

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Abstract content (Max 300 words) Formatting & Special chars

An overview of the research done within the CSIR's National Laser Centre and the University of the Witwatersrand's Structured Light group will be presented. Our main focus will be on implementing digital holograms for the creation and detection of the spatial modes of light – the various patterns of light. We make use of modal decomposition theory to determine the numerous properties of light, from the modal content of laser beams to decoding the information stored in optical fields carrying orbital angular momentum. Although the modal decomposition of light has been known for a long time, applied mostly to pattern recognition, we illustrate how this technique can be implemented with the use of liquid-crystal displays. We demonstrate the versatility of these techniques to characterize both structured and vector fields with static and propagating optical fields. Finally, we show a holographic technique to realise a communication link using a densely packed spatial mode set where we experimentally multiplex and demultiplex over 100 spatial modes.

Apply to be considered for a student award (Yes / No)?

No

Level for award (Hons, MSc, PhD, N/A)?

N/A

Main supervisor (name and email) and his / her institution

N/A

Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

No

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Yes

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