

Tailoring Light Beyond the Textbook

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Abstract— In recent years there has been an explosion in so-called structured light, where light is tailored beyond the familiar textbook forms for full control of all of light's degrees of freedom. This has given rise to exotic control in space and time, light with topology, and even extended to quantum entangled states of light. This has in turn opened up diverse application areas, including fast and secure communication, imaging beyond the diffraction limit, and sensing beyond the classical limit. In this talk I will explore how this exciting field has developed, and outline its tremendous future potential.

Andrew is presently a Distinguished Professor within the School of Physics at the U. Witwatersrand (South Africa) where in 2015 he established a new laboratory for Structured Light. He is a Fellow of SPIE, Optica, the South African Institute of Physics (SAIP), an elected member of the Academy of Science of South Africa and editor-in-chief of the IoP's Journal of Optics. Andrew has won several awards for his research, including the NSTF national award for his contributions to photonics in South Africa (2015), the Georg Forster prize from the Alexander von Humboldt Foundation for outstanding contributions to photonics (2020), the SAIP Gold Medal (2020), the highest award for physics in South Africa, making him the youngest winner to date, the Sang Soo Lee award from Optica and the Korean Optical Society (2022) and the TWAS prize for Physics (2024). He is Director of South Africa's Quantum Technology Initiative.

