



**PRINCIPAL  
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# A hybrid classical-quantum communication link

## Key benefits

- Fundamentally secure communication
- Fast data transfer



Andrew spent several years working as an applied laser physicist, first for the South African Atomic Energy Corporation and then as Technical Director in a private laser company. In 2004 he joined the CSIR National Laser Centre where he was Chief Researcher and Research Group Leader of the Mathematical Optics group. In 2015 Andrew joined Wits where he established a new Structured Light laboratory. Andrew chairs/serves on multiple committees for international conferences, OSA and SPIE, and is on the editorial board of three optics journals. He has published more than 300 scientific papers, is cited as inventor on several patents, and has delivered more than 70 invited talks internationally. In promoting photonics in South Africa, he is a founding member of the Photonics Initiative of South Africa, a Fellow of both SPIE and the OSA, and an elected member of the Academy of Science of South Africa. In 2015 Andrew won a national award for his contribution to photonics in Africa.

The ultimate aim of a modern day communications system is to transmit data using a high-bandwidth link, while at the same time ensuring that the link is secure. High-bandwidth classical communications links are presently available and under continuous development the world over. In parallel, security can be achieved using a quantum link, with some simple systems commercially available. No solution exists to combine the two to realise the desired "fast and secure" link.

Wits researchers have developed a hybrid communication system that allows information to be sent both classically and in the quantum using the same link, realising a communication channel that is both fast and secure. The security is guaranteed through quantum laws and as such is fundamentally secure, unlike conventional cryptographic systems.

## STAGE OF DEVELOPMENT

The concept has been tested and shown to work theoretically and experimentally in the laboratory. A prototype is currently being tested.

## INDUSTRIAL APPLICATIONS

Environments requiring fast and secure communication across either free-space or fibre, e.g., a line-of-sight link between two points of military importance, between banks and stock exchanges, etc.

## PARTNERSHIP OPPORTUNITY

Potential development partners are being sought to undertake technology development, business development and prototyping for commercialisation.

## CONTACT

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