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## Quantum Networking with Graph States

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**Abstract content** (Max 300 words) [http://events.saip.org.za/getFile.py/?target=\\_blank](http://events.saip.org.za/getFile.py/?target=_blank) **Formatting & Special chars**

Distributed quantum communication and quantum computing offer many new opportunities for quantum information processing. Here networks based on highly nonlocal quantum resources with complex entanglement structures have been proposed for distributing, sharing and processing quantum information. Graph states in particular have emerged as powerful resources for such tasks using measurement-based techniques [1]. I will present recent experimental and theoretical work that uses photonic graph states for quantum networking tasks, including quantum secret sharing and robust-to-loss quantum communication. I will show that graph states are a promising approach for sophisticated multi-layered and loss-tolerant protocols in quantum optical networks.

[1] B. A. Bell et al., Nature Communications, in press (2014).

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

No

**Level for award (Hons, MSc, PhD)?**

NA

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

Prof. Mark Tame  
tame@ukzn.ac.za  
University of KwaZulu-Natal

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

No

**Primary author:** Prof. TAME, Mark (University of KwaZulu-Natal)

**Presenter:** Prof. TAME, Mark (University of KwaZulu-Natal)

**Session Classification:** Theoretical

**Track Classification:** Track G - Theoretical and Computational Physics