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Shaping the Future: A Physics Journey to Groundbreaking Research in Quantum Technologies

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Quantum communication holds the promise of ultra-secure information transfer and lays the foundation for the future quantum internet. At the heart of this vision is the ability to distribute entanglement and quantum keys over long distances, including via satellite. My research focuses on free-space quantum communication, and most recently, on implementing satellite-based quantum links. In a ground-breaking achievement, we implemented South Africa's first quantum satellite link, and the longest intercontinental quantum satellite secure link of 12900 km between China and South Africa, which was published in a recent Nature (2025) publication. This achievement establishes a critical foundation for Africa's sustained participation in and contribution to the global quantum research and innovation landscape.

As a female physicist navigating the scientific landscape in Africa, I have also been fortunate to benefit from strong mentorship, collaborative networks, and an unwavering belief in the potential of homegrown excellence. These experiences have taught me that developing scientific capacity is dependent on building collaborations.

In this lecture, I will share my journey, from the early days of navigating local constraints in quantum optics to conducting cutting-edge research. Along the way, I hope to offer a message of encouragement to young women in physics and a vision of what is possible when dedication meets opportunity.

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