UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE

CQCtec
Centre for Quantum Computing & Technology

Invitation to a

Tutorial Talk

UKZN's Centre for Quantum Computing and Technology proudly presents a talk by Distinguished Professor Andrew Forbes from the University of the Witwatersrand on a subject from the frontiers of modern optics. Prof Forbes is a world class (A-rated) researcher and expert of light with structured wave fronts, that can be used for communication and imaging. In this talk he will introduce us to the fascinating possibilities carried by light with (topological) properties that are stable under fluctuations of the propagation medium. Prof Forbes is also the director of the Quantum Technology Initiative of South Africa. The Centre, which is part of the Initiative, organises a series of talks relevant for quantum technology. This new technology requires interdisciplinary solutions from physics, engineering, computer science as well as from mathematics. Topology is a major branch of mathematics.

TOPIC:

WEAVING TOPOLOGY INTO LIGHT

SPEAKER:

Andrew Forbes

School of Physics, University of the Witwatersrand, Johannesburg

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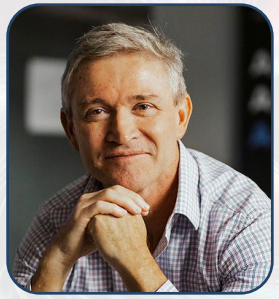
29 MAY FRIDAY 2026 | **12h15-13h15** | STEC (Science and Technology Education Centre), UKZN Westville Campus

RSVP ESSENTIAL: Nokwanda Majola / majolan6@ukzn.ac.za / 031 260 1686

INSPIRING GREATNESS

ABOUT THE TUTORIAL TALK:

In the early 1960s, inspired by developing notions of topological structure, Tony Skyrme suggested that sub-atomic particles be described as natural excitations of a single quantum field. Although never adopted for its intended purpose, the notion of a skyrmion as a topologically stable field configuration has proven highly versatile, finding application in condensed matter physics, acoustics and more recently optics. A recent trend in structured light is to imbue optical fields with such a topology, promising a topological alphabet that is robust to noise. Using examples from classical and quantum optics, I will highlight the recent progress made in this field and the exciting future prospects.



ABOUT THE SPEAKER:

Professor Andrew Forbes has at various times in his career found himself as teacher, janitor, secretary, receptionist, webmaster, systems engineer, sales rep, manager, director, and sometimes a scientist. He 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, PIERS, the South African Institute of Physics (SAIP), an elected member of the Academy of Science of South Africa and Director of South Africa's Quantum Initiative. Andrew is an active populariser of science through numerous popular articles, television shows and radio contributions, is an A-rated researcher, and is the only physicist from South Africa on the Clarivate Highly Cited Researchers list (2024 and 2025). He has won many awards, including the national NSTF Photonics award (2015), the Alexander von Humboldt Georg Forster Prize and Fellowship (2020) and the SAIP Gold Medal (2020), the highest award in physics in South Africa, making him the youngest winner to date. More recently he has received the Sang Soo Lee award (2022) from the Korean Optical Society and Optica for leadership in photonics, the Physics prize by TWAS (2024) for outstanding contributions to structured light, the national NSTF award for Quantum (2025) and the Harry Oppenheimer Trust Fellowship award (2025), the most prestigious science award in South Africa. His research interests cover all forms of structured light and their applications.

Refreshments will be provided after the talk