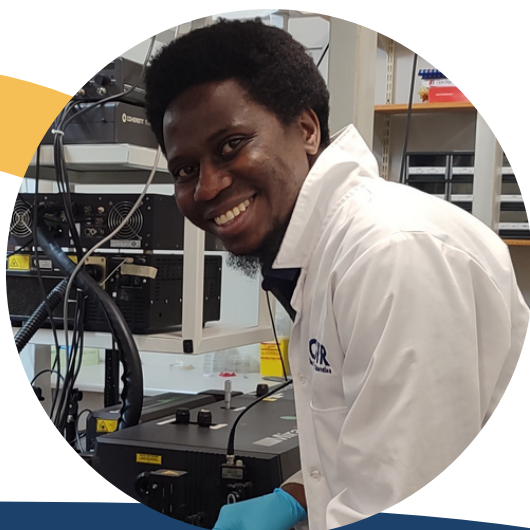


QUANTUM PERSPECTIVES: WITS & IBM SEMINAR SERIES

QUANTUM TECHNOLOGIES FOR NEXT-GENERATION DIAGNOSTIC DEVICES



Dr. Kelvin Mpofu
Council for
Scientific and
Industrial Research
(CSIR)



30 JULY
13:15-14:30 SAST
Venue:

In person: Wits Gatehouse,
Science Boardroom GH102
Online: [Teams link](#)



Refreshments will be provided

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Quantum technologies are rapidly transforming the landscape of biomedical diagnostics. In this talk, we explore how advances in quantum optics, quantum computing, and quantum machine learning are driving the development of highly sensitive, miniaturized, and intelligent diagnostic platforms. Drawing from our work in quantum optical biosensing, we demonstrate how phenomena can be leveraged to enhance detection sensitivity beyond classical limits. We further highlight the potential integration of quantum machine learning models in biosensing applications. Finally, we explore the role of quantum computing in simulating molecular systems relevant to biology and chemistry, optimizing diagnostic protocols, and solving inverse problems in sensor design. Together, these emerging quantum paradigms point toward a new era of precision diagnostics with broad implications for global health, environmental monitoring, and personalized medicine.