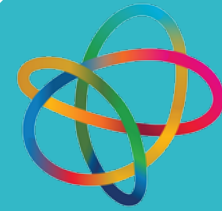


SCIENCE WITH JAZZ SEMINAR SERIES

“Where Science and Jazz combine”



INTERNATIONAL YEAR OF
Quantum Science
and Technology



23 JAN
Thursday 2025



15h00



UKZN Centre for Jazz and Popular Music,
Howard College, Shepstone Building, level 2

SPEAKER:

Professor David Davis, Sol Plaatje University

TOPIC:

Alan Turing:
the man and his machine

JAZZ ARTIST:

Sibusiso Mash Mashiloane,
UKZN

SYNOPSIS: The English intellectual Alan M. Turing (1912-1954) was many things: a mathematician (with an interest in quantum mechanics), a logician, a cryptanalyst (crucial to the Allied war effort in WWII), a philosopher, a theoretical biologist, and, last but by no means least, the father of theoretical computer science. There is little doubt that today Turing would have been knighted. Instead, in his own lifetime he was persecuted for being too open about his homosexuality, and committed suicide following hormonal treatment (“chemical castration”). In this talk, we discuss his simple yet profound ideas about the limitations of mathematical thought. With little more than the example of a typewriter to fuel his imagination, and his understanding of how humans perform systematic calculations (the “computers” at the time of his work), he conceived of a mechanical device which could prove mathematical assertions by carrying out automatically a sequence of simple instructions. Furthermore, he developed a method of encoding instructions which made it clear that his machine was universal in the sense that it could replicate the work done by any machine (with easily distinguishable internal states). Ultimately, Turing was able to establish that there exist assertions which no mechanical process can decide are provable. By thinking about what people actually did in the world around us, Turing resolved a central question in mathematics (Hilbert’s Entscheidungsproblem). As a by-product, he initiated the field of theoretical computer science.



ABOUT E. DAVID DAVIS: Professor Davis studied physics at UCT and Wits. He received his PhD from Wits under the supervision of Dieter Heiss. After two post-Doctoral positions at the Max-Planck-Institut für Kernphysik (in Heidelberg, Germany) and the University of Arizona (in Tucson, USA), he was awarded an Alexander von Humboldt Foundation fellowship in 1992. Since then he has worked at the University of Stellenbosch, Kuwait University and North Carolina State University. He is now at Sol Plaatje University in Kimberley. His research interests span quantum phase transitions, random matrix models of quantum systems, probes of physics beyond the Standard Model of particle physics, and statistical aspects of quantum computing.



ABOUT SIBUSISO MASH MASHILOANE: Sibusiso Mash Mashiloane is a Durban-based, multi-award winning South African pianist and composer of remarkable skill and passion, hailed as an authority on South African music. After exploring his craft for many years, seeking to capture its essence and the feeling of being “at home,” he is currently in the finishing stages of his PhD at the University of KwaZulu-Natal, where he also lectures in jazz piano and music theory. Since 2016, Mashiloane has released an album a year, winning 6 awards and being nominated for 8 more, including the SAMAs, Urban Music, Mzantsi Jazz and AFRIMA Awards. His extraordinary list of collaborations with some of the top South African musicians spans over a decade, and he has also performed in several countries, including Tanzania, the USA, and Mozambique.

ABOUT THE SCIENCE WITH JAZZ SEMINAR SERIES:

2025 is the UNESCO year of Quantum Science and Quantum Technology. In this context the initiated Centre for Quantum Computing and Technology at UKZN’ presents a series of science seminars combined with Jazz concerts, that informs about relevant concepts in science and technology and their societal impacts. This monthly series intends to inspire inter-disciplinary discussions and synergies, in particular between the sciences and the arts.

Our January session explores Computers and Jazz, which developed simultaneously as expressions of modernity. Professor David Davis from Sol Plaatje University discusses the invention of the digital computer, and is joined on the piano by Jazz musician Mr Sibusiso Mash Mashiloane from UKZN.

Professor Thomas Konrad, Director Designate: Centre for Quantum Computing and Technology, UKZN

Refreshments and a cash bar will be available

ENQUIRIES: Thulile Zama / zamat1@ukzn.ac.za / 031 260 3385

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