



SCIENCE WITH JAZZ SEMINAR SERIES

"Where Science and Jazz combine"

20 FEB 2025
Thursday

15h00

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

SPEAKER:

Thomas Konrad, School of Chemistry and Physics, UKZN

TOPIC:

Quantum Revolutions and Jazz

JAZZ ARTIST:

Ernest Dawkins & Ndoduzo Makathini

SYNOPSIS: At the end of the 19th century there was a firm belief in technological progress based on the notion of absolute laws to understand and control the world around us. This belief was disrupted in the 20th century by new findings in the sciences and the humanities, literature, the arts. In the second seminar of our monthly series we portrait the revolutions of Quantum Physics and Jazz. In order to show possible relations we attempt a new format: a dialogue between science and music.

Quantum Mechanics (QM) does in general not permit to ascribe properties to particles such as a definite position and a definite momentum. Is it possible to imagine a particle that is not localized but present in various positions simultaneously? Or do we have to think differently about quantum systems such as atoms, electrons and photons?

As a consequence of indefinite properties QM introduces random measurement results, non-deterministic evolution and, in addition, non-local properties of remote pairs of particles (entanglement). While these notions have been rejected by some of its founding fathers, they lead to new discoveries in the first quantum revolution (transistors, lasers, nuclear power stations) and in the second quantum revolution (quantum computers, quantum communication, quantum sensing). This seminar discusses the foundational concepts of QM and describes how they enable recent Quantum Technology. If there is time we explain elements of the notation of QM and Free Jazz.



THOMAS KONRAD holds a Master of Science from the Eberhard-Karls University in Tübingen (Germany) with a dissertation in celestial mechanics, a Master of Science of the University of London (Imperial College) in quantum field theory and a doctorate in theoretical physics from the University of Konstanz. He joined UKZN in 2006, served on the Council of the South African Institute of Physics (SAIP), on Senate of UKZN, as editor of the SAIP online journal Physics Comment from 2012 to 2017 and as editor of the New Journal of Physics (IOP) since 2023. He is research professor at the School of Chemistry and Physics at UKZN and currently setting up the Centre for Quantum Computing and Technology. Thomas Konrad pioneers research in quantum information processing and communication. He is an internationally recognised researcher with a NRF B-rating. Konrad promotes the interplay between science and arts.



Ernest Dawkins is one of the worlds foremost saxophonists and composers, dedicated to ensuring his music reflects the dynamic and evolving cultural memory of the African American aesthetic.

In 2024, Dawkins composed, arranged, and recorded a Jazz Poetry Opera titled Paul Robeson: Man of the People. In December 2022, he was commissioned by the Jazz Institute of Chicago to create Tim Black, Blacker Than Black. In October 2021, South Arts commissioned him to compose Refound Connections. In 2020, Chamber Music America commissioned him to compose and record Redefining Frederick Douglass, a work honoring the abolitionist legacy.

In 2018, Dawkins, alongside the Old Town School of Folk Music, received the International Connections grant from the MacArthur Foundation, funding their 2019 tour of South Africa. This collaboration resulted in the Englewood to Soweto project and the recording of We Want Our Land Back.

In 2016, Dawkins was honored with the Joyce Award and composed Quantum Englewood, a piece celebrating the rich cultural legacy of Englewood, Chicago.



NDUDUZO MAKATHINI is an improviser, scholar and musicologist at the University of KwaZulu-Natal school of the arts with a PhD in music obtained from Stellenbosch University. Makhathini's practice and scholarship focus on constructing alternative sites for practicing and theorising jazz studies in South Africa that consider ba-ntu cosmologies as points of departure.

Makhathini is also a multi award winning artist and internationally acclaimed musician from Pietermaritzburg in KwaZulu-Natal. As a bandleader, Makhathini holds 12 albums under his belt and he features on many as a sideman and producer. He is currently signed to the prestigious Blue Note Records in the US and has a busy tourist schedule that keeps him relevant in current jazz practices and discourses. Makhathini has collaborated with Wynton Marsalis and the Jazz at Lincoln Centre Orchestra, Richard Bona, Hamilton de Holanda, (the late) Zim Ngqawana, Omagugu, Shabaka Hutchings, Black Coffee, Thandiswa Mazwai, Mbuso Khoza and most recently, the WDR Big Band just to name a few of his favourite musicians that he has worked with.

Makhathini has also done reputable festivals around the globe such as Umbria Jazz Fest, Joy of Jazz, Jarasum Jazz Fest, Chicago Jazz Fest, Montreal Jazz Fest and Cape Town International Jazz Fest among others.

Currently, Makhathini is performing his recent offering uNomkhubulwane (2024) out on Blue Note Records. uNomkhubulwane is understood to be a mythical rain Goddess who regulates fertility through the language of water. The album is underpinned by an understanding of mythical institutions of Nguni peoples of Southern Africa, their connection to the cosmos and how that relates to ingoma (sound making and healing strategies).

Makhathini has recently returned from a long US, South America and European tour that included his debut at the historical Carnegie Hall in New York and at the Koln Philharmonie.

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



INTERNATIONAL YEAR OF
Quantum Science
and Technology

Refreshments and a cash bar will be available

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