

S E M I N A R



Dr Yanga Bavuma
(University of Cape Town)

Date:

Thursday, 29 May 2025

Time:

12h15-13h15 SAST

Venues:

- **NITheCS Seminar Room**
University of KwaZulu-Natal
Westville Campus
3rd Floor, H-Block,
School of Chemistry and Physics
- **Online**

WHO SHOULD ATTEND?

This seminar is intended to be accessible to postgraduate students. All are welcome!

ENQUIRIES:

Email Neli Mncube: neli.mncube@nithecs.ac.za

On an infinite family of integral Cayley graphs of Pauli groups

ABSTRACT:

The classical Pauli group can be obtained as the central product of the dihedral group of 8 elements with the cyclic group of order 4, or as the central product of the quaternion group of 8 elements with the cyclic group of order 4. Inspired by this characterization, we introduce the notion of central product of Cayley graphs, which allows to regard the Cayley graph of a central product of groups as a quotient of the Cartesian product of the Cayley graphs of the factor groups. We focus our attention on the Cayley graph of the generalized Pauli group on n -qubits; in fact, this generalised Pauli group on n -qubits may be decomposed as the central product of finite 2-groups, and a suitable choice of the generating set allowing us to recognize the structure of central product of graphs in the Cayley graph of the generalised Pauli group with the appropriate generating set.

Using this approach, we are able to recursively construct the adjacency matrix of this Cayley graph for each natural number, and to explicitly describe its spectrum and the associated eigenvectors.

Dr Yanga Bavuma is a lecturer in the Department of Mathematics and Applied Mathematics at the University of Cape Town.

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