NITheCS
National Institute for Theoretical and Computational Sciences

C O L L O Q U I U M

Symmetries – in and around us

Prof Abdul H. Kara (University of the Witwatersrand)

DATE: Monday, 29 September 2025 | 16h00–17h00 SAST

VENUES:
- **Stellenbosch University**: Neelsie Cinema
- **University of the Witwatersrand**: Room P215, 2nd Floor, Physics Building
- **North-West University**: Seminar Room K310, Physics Building G5
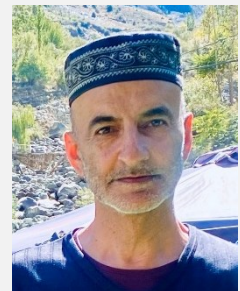- **Online**

--- *A recording of the talk will be published on the NITheCS YouTube channel afterwards* ---

ABSTRACT

Symmetry is abundantly present in nature in many forms, and mathematics is no exception. The theory and methodology behind constructing symmetries for differential equations (DEs) are now well established and documented. These symmetries play a central role in the analysis of DEs, particularly in finding exact solutions, with applications ranging from relativity to fluid mechanics. Furthermore, the relationship between symmetries and conservation laws – a subject of interest during the 1800s – culminated in Noether's celebrated work on variational DEs. This talk will provide a broad overview of these ideas, tracing their development in the past, their role in the present, and their potential for the future.

BIOGRAPHY

Abdul H. Kara completed all his studies at the University of the Witwatersrand (Wits). Apart from one year as a school teacher, he has been at Wits throughout his academic career – from Junior Lecturer to Professor. His PhD thesis focused on the symmetries of differential equations, Euler–Lagrange equations, and their relationship with conservation laws. Abdul has collaborated and published with researchers from China, the US, Russia, Pakistan, as well as with his students from South Africa and abroad. He continues to apply his work in mathematical physics, engineering, and relativity, and extend his research to include discrete equations and fractional differential equations.

REGISTER
TO ATTEND
https://bit.ly/4gCVh3j

SUBSCRIBE
TO THE NITheCS MAILING LIST: