Workshop on symmetry analysis of Differential equations

2025 International Conference and Workshop on Modeling and Simulation of Complex Systems

University of Ibadan, July 23 – 25, 2025

Workshop Learning Objectives

At the end of this workshop, participants will be able to

- Understand what is meant by the invariance of a differential equation
- Understand the concept of group transformations
- Derive infinitesimal transformations of the Lie group of transformations
- Determine Lie point symmetries of ordinary differential equations
- Use the derived Lie point symmetries to integrate ordinary differential equations
- Determine Lie point symmetries of Partial differential equations
- Use the derived Lie point symmetries of partial differential equations to determine similarity solutions which are then used to reduce partial differential equations to ordinary differential equations

Workshop Prerequisites

- Required knowledge level: Basic differential calculus, ordinary and partial differential equations
- Register for the 2025 ICAWMSCS Conference & Workshop
- Prior to the conference day, you will receive workshop materials (videos **(if available)**, instructions on how to download **REDUCE or YaLie** software, example dataset **(optional)**, written codes **(if available)**, and workshop slide deck). Ensure that you:
    - review the content before the workshop day.
    - download the mentioned software on your personal computer prior to the first day of the conference.
    - Get familiar with the codes.

Workshop Facilitators

Adewunmi Gideon Fareo , PhD

(about the facilitator)

Adewunmi Gideon Fareo is a senior lecturer of Computational and Applied Mathematics at the University of the Witwatersrand, Johannesburg. His research interests include symmetry analysis of differential equations, heat and mass transfer problems, hydraulic fracturing. He is a member of the South African Mathematical society(SAMS) and the Southern African Mathematical Sciences Association (SAMSA).