UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

NITheCS
National Institute for Theoretical and Computational Sciences

S E M I N A R

Dr Andronikos Paliathanasis
(University of Athens)

A Physics Perspective on Biological Dynamics: Classical Mechanics Analogy

ABSTRACT

Motivated by the unifying role of variational principles in theoretical physics, we investigate the possibility of formulating biological dynamics within a Hamiltonian framework. This approach emphasizes the structural parallels between nonlinear dynamical models in biology and dynamical systems in physics, enabling us to treat biological systems analogously to point-like particles. Such a perspective provides a pathway to identify conserved quantities and symmetries within biological dynamics.

Dr Andronikos Paliathanasis is a researcher in theoretical and mathematical physics, with a background in the geometric and algebraic analysis of differential equations, symmetry methods, and their applications in cosmology and gravitational theories. He holds a PhD in Physics from the University of Athens, where his doctoral research focused on the role of symmetries and integrability in the analysis of physical systems. His research spans a wide range of topics in mathematical physics and cosmology. He has published over 300 peer-reviewed articles in international journals, with a strong citation record and an h-index 50. He is an active reviewer for many journals in mathematical and theoretical physics and has served on organising committees for international conferences. He has supervised undergraduate and postgraduate students and taught courses in both mathematics and physics. Recently, his work has expanded to include the use of statistical and machine learning techniques in the analysis of cosmological data. He is an NRF B-Rated researcher and maintains strong collaborations with institutions in South Africa and abroad.

Date:
Thursday, 13 November 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?
The seminar should be accessible to advanced undergraduates and will highlight results that should interest advanced researchers.

ENQUIRIES:
Email Dr Cerene Rathilal: RathilalC@ukzn.ac.za

REGISTER: https://bit.ly/47aLgXQ

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NRF National Research Foundation