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COLLOQUIUM

Misinformation Dynamics in Social Networks

Prof Jeff Murugan (University of Cape Town)

DATE: Monday, 23 February 2026 | 16h00–17h00 SAST

VENUES:
- **Stellenbosch University:** NITheCS Seminar Room, Merensky Building
- **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

Information circulating on modern communication platforms degrades not only through deliberate disinformation, but also through collective social dynamics and network structure. In this talk, I will present a theoretical framework that models information fidelity as a continuous field evolving across layered social networks representing private, group, and broadcast communication. We identify three universal mechanisms that control information quality: convergence toward group consensus, dilution at community bridges, and a global balance between truth injection and structural decay. Together, these results show that increased connectivity can reduce information integrity, and point to quantitative strategies for improving fidelity in large-scale communication systems.

BIOGRAPHY

Jeff Murugan is Professor of Mathematical Physics in the Department of Mathematics & Applied Mathematics at the University of Cape Town (UCT). Former Acting Deputy Vice-Chancellor for Research and Internationalization, he is also a Simons Associate at the International Center for Theoretical Physics in Trieste, Italy, a former member of the School of Natural Sciences at the Institute for Advanced Study in Princeton, and a current member of the Academy of Science of South Africa.

Prof Murugan's research interests are primarily in understanding emergent phenomena, from spacetime to the properties of quantum matter and information. His most recent focus has been on low-dimensional quantum field theories, topological quantum matter and quantum chaos in disordered systems where he has made seminal contributions to low-dimensional dualities and disordered conformal field theories.

He is also a recipient of a Distinguished Teacher Award and a Fellow of the UCT College of Fellows.

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