

NITheCS Internship Programme 2024/2025 RESEARCH TOPICS

TOPIC	HOST	HOST INSTITUTION
<ol style="list-style-type: none"> 1. Foundational capabilities of discrete-event models for societal impact. 2. Multiscale model verification, validation (V&V) and uncertainty quantification (UQ) using statistical algorithms. 3. Theoretical foundations of machine learning models V&V and UQ. 4. Data-driven machine learning models and algorithms. 5. Data mining, management and modelling for decision making. 6. Integrated multiscale modelling and simulation. 	Dr David Tshwane	CSIR
<ol style="list-style-type: none"> 1. Compact Stars as Laboratories for Matter at Extremes and Fundamental Physics 2. Physics and Evolution of the Early Universe 3. Physics of Core-Collapse Supernovae 4. Quantum Information Science 5. Relativistic Fluid Dynamics in Heavy-Ion Collisions and Particle & Nuclear Astrophysics 6. Relativistic Kinetic Theory in Heavy-Ion Collisions and Particle & Nuclear Astrophysics 7. Statistical and Thermal Physics in Heavy-Ion Collisions and Particle & Nuclear Astrophysics 8. Theoretical & Computational Physics & Finance 9. Theoretical & Computational Physics & the Environment 10. Theoretical and Computational Biophysics and Medical Physics 11. Theory and Phenomenology of Relativistic Heavy-Ion Collisions 12. Trends in Computational, Mathematical and Physical Sciences Education in South Africa 13. Complex Systems Science 	Prof Azwinndinni Muronga	Nelson Mandela University
<ol style="list-style-type: none"> 1. Can we measure Fermi constant with astronomical data? 2. Large-scale structure correlations in the Universe 3. Neutral hydrogen evolution in galaxies 	Prof Yin-Zhe Ma	Stellenbosch University
<ol style="list-style-type: none"> 1. Categorical Algebra 2. Lattice Theory 3. Logic and Computation 4. Theory of Forms 	Prof Zurab Janelidze	
<ol style="list-style-type: none"> 1. Introduction to open quantum systems 2. Introduction to quantum computing 	Prof Francesco Petruccione	
<ol style="list-style-type: none"> 1. Rings and related structures 	Prof Amartya Goswami	University of Johannesburg
<ol style="list-style-type: none"> 1. Application of Machine Learning to Predict Quantum Correlations 2. Quantum Simulation of Open Quantum Systems using Near-Term Intermediate-Scale Quantum (NISQ) Devices 	Prof Ilya Sinaskiy	University of KwaZulu-Natal
<ol style="list-style-type: none"> 1. Emergent Quantum Phenomena in Non-Equilibrium Many-Body Systems 2. Computational Ghost Imaging for Smart City Applications. 	Dr Aniekan Magnus Ukpog	