NITheP
National Institute for Theoretical Physics

NITheP Colloquium
Monday, 19 April 2021, 16h00

Dr Aniekan Magnus Ukpong | University of KwaZulu-Natal

"High-Performance Computing: Insights from Condensed Matter and Materials Physics"

Research work is currently being done to develop a fundamental understanding of a broad range of physical and chemical properties of macroscopic many-body condensed matter systems from first principles. This has typically involved finding computational solutions to the electronic structure problem by implementing the Kohn-Sham ansatz of density functional theory. The overall goal has been to obtain the total energy of the system as the self-consistent ground state, and high-performance computing has become an indispensable workhorse for this purpose. In this talk, I will introduce our computational research activities, and share some scientific highlights from our recent projects. I will emphasize potential research areas wherein our emerging interests in the new computing paradigms of machine learning, big data analytics and materials informatics can serve as fertile grounds for successful collaborations within the existing framework for Theoretical and Computational Sciences research at the UKZN.

BIOGRAPHY

Dr Aniekan Magnus Ukpong studied Physics in Nigeria, where he graduated with a BSc(Hons) degree in Physics from the University of Calabar in 1997, and an MTech degree in Solid State Physics at the Federal University of Technology Akure in 2002. He obtained a PhD in Physics at the University of Cape Town in 2008, where he specialized in Condensed Matter and Materials Physics. He has subsequently completed two postdoctoral fellowships: one in computational thermodynamics of strong metals at the University of the Witwatersrand between 2008 and 2011, and another at the University of Pretoria between 2011 and 2013. Currently, he is a Senior Lecturer in Physics at the University of KwaZulu-Natal in Pietermaritzburg.

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