NITheCS
National Institute for Theoretical and Computational Sciences

NITheCS Mini-School
Tuesday, 2, 16, 23 & 30 August 2022, 15h00 – 16h00 SAST
Dr Amartya Goswami (UJ) and Prof Zurab Janelidze (SU)

'Elementary introduction to Set Theory'

ABSTRACT

This mini-school aims to give a very basic introduction to set theory, a mathematical 'theory of everything'. No prior experience in mathematics is required for most of the lectures.

Set theory is, on one hand, a theory of infinity. On the other, it is a uniform intuitive language for describing any scientific phenomenon that can be rigorously formalised. Set theory is based on the idea that any mathematical structure can be decomposed into more basic constituents, called its elements. By studying the organisation of elements (and possibly their elements, and their elements, and so on), it becomes possible to understand the essence and function of a given mathematical structure.

This view may seem to oppose the approach of category theory, which tries to study mathematical structures in terms of their interaction with other structures, rather than by looking at elements within those structures. However, the two theories are intimately related. We will touch on this relationship in the context of the concepts of category theory dealt with in the 2021 NITheCS mini-school, '*Elementary Introduction to Category Theory*'.

BIOGRAPHIES

AMARTYA GOSWAMI
After obtaining an MSc from Calcutta University (India), Amartya obtained his PhD at UKZN.

Before joining the UJ, he worked at the Universities of Zululand and Limpopo. His current research interests are in abstract algebra, category theory, and commutative algebra. For the past five years he has been co-organising a special session in Categories, Algebra, Topology and Logic at the South African Mathematical Society annual congress.

ZURAB JANELIDZE
Zurab is a mathematician working at SU since 2009. He leads the Undergraduate Programme in Mathematical Sciences of the Faculty of Science and coordinates Foundations of Abstract Mathematics modules, courses at 2nd and 3rd year levels designed for undergraduate students to develop mathematical research skills. He serves on the editorial boards of major international journals in category theory: *Applied Categorical Structures* and *Cahiers de Topologie et Géométrie Différentielle Catégoriques*. He also currently serves as the President of the South African Mathematical Society.

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