

CoE-MaSS weekly seminar series

THE DST-NRF CENTRE OF EXCELLENCE IN
MATHEMATICAL AND STATISTICAL SCIENCES (CoE-MaSS) PRESENTS A
SEMINAR BY

Dr Martin Weigt

*(Department of Mathematical Sciences, Nelson Mandela University,
Port Elizabeth, South Africa)*

“Operator algebras and non-normed topological algebras”

Friday, 21 September 2018

10h30-11h30

CoE-MaSS Seminar Room, 1st floor,

Math Sci Bldg, West Campus, Wits University.



Von Neumann algebras were initiated by J. von Neumann and F. Murray in the late 1930s in order to address certain problems in quantum theory, and has become a well-developed subject since then. Somewhat later, in 1943, I. M. Gelfand and M. A. Naimark introduced C^* -algebras in order to assist them in developing the theory of group representations. Their seminal paper contained the well-known representation theorems of C^* -algebras which laid the foundation for further research in these algebras. It was later realized that one can think of observables in quantum mechanics as self-adjoint elements in either a von Neumann algebra or a C^* -algebra. However, the observables appearing in quantum mechanics are unbounded linear operators on a Hilbert space, whereas the operators in von Neumann and C^* -algebras are bounded linear operators on Hilbert spaces. This motivates a general investigation of algebras consisting of unbounded linear operators on Hilbert spaces, as well as topological $*$ -algebras which are not normed in general. In this direction, it is fitting to note that the study of general topological $*$ -algebras and their representations was motivated in part by H. J. Borchers and A. Uhlmann's reformulation of A. Whiteman's axioms of quantum field theory. In this talk, we give a survey of operator algebras, unbounded operator algebras, and non-normed topological $*$ -algebras and the authors contributions to these topics.

Email: Martin.Weigt@mandela.ac.za , weigt.martin@gmail.com



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