

MATHEMATICAL STRUCTURES FOCUS AREA SEMINAR

Coherent and Ideal Actions

Prof Giuseppe Metere (University of Milan, Italy)

DATE: Thursday, 23 April 2026 | 14h00 – 16h00 SAST

VENUES:

- Stellenbosch University (Room 1006, Mathematical Sciences & Industrial Psychology Building)
- Online

ABSTRACT

Actions are a pervasive concept in algebra. In the setting of ideally exact categories, we introduce the notions of internal coherent action and internal ideal action, capturing two different aspects of unitary actions in rings and algebras.

In the classical case of rings, if a unitary ring B acts on a ring (or ideal) X , one may ask either that the multiplicative unit of B act unitarily on X , thus obtaining a coherent action, or that the split epimorphism arising from the associated semidirect product be unitary, thus obtaining an ideal action. While these two requirements coincide for rings, there is no evident reason for this to persist in the more general framework of ideally exact categories. In fact, we prove that every ideal action is coherent, and that the converse holds in several contexts of interest.

The first part of the seminar will present explicit algebraic instances of this phenomenon. The second part will introduce the categorical framework and develop the constructions and results in full generality.

This talk is based on joint project with M. Mancini and F. Piazza.

BIOGRAPHY

Giuseppe Metere graduated in Mathematics from the University of Milan, Italy, in 2003, where he also obtained his PhD in 2008.

He began his academic career in the Department of Mathematics and Computer Science at the University of Palermo, Italy, in 2013. Since 2024, he has been Associate Professor in the Department of Food, Environmental and Nutritional Sciences at the University of Milan.

His research is mainly focused on category theory and abstract algebra; he is also interested in the public communication of mathematics and science more broadly.

He is a member of the National Academy of Sciences, Letters and Arts of Palermo and a co-founder of ItaCa, an Italian community of category theorists.



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