Algebras determined by the left and the right parts of their module categories

Flávio Ulhoa Coelho
IME-USP
São Paulo - SP

The main aim of the representation theory of artin algebra is to characterise an algebra by properties of its module category. For this purpose, numerical invariants, such as the projective and the injective dimensions of a module, are especially useful. As a first step, one could consider the modules with its projective (or injective) dimension at most one but, as one can easily see, such modules occur in a scattered fashion inside the module category. To overcome this difficulty, one can consider the so-called left and right parts of the module category mod$A$ (where A is an artin algebras). The left part of mod$A$ indicates its subcategory consisting of indecomposable modules whose predecessors have all projective dimension at most one. The right part is defined dually. These subcategories have been introduced by Happel, Reiten and Smalø in their study of quasi-tilted algebras and since then, many generalizations of such class of algebras were introduced and studied over the years, such as the shod, weakly shod, laura of left (and right) supported algebras. In the study of all these classes, the left and the right parts of the module category have played an essential role.

The aim of this talk is to present these classes of algebras, their existing characterisations and main properties, underlining the use of the left and right parts.