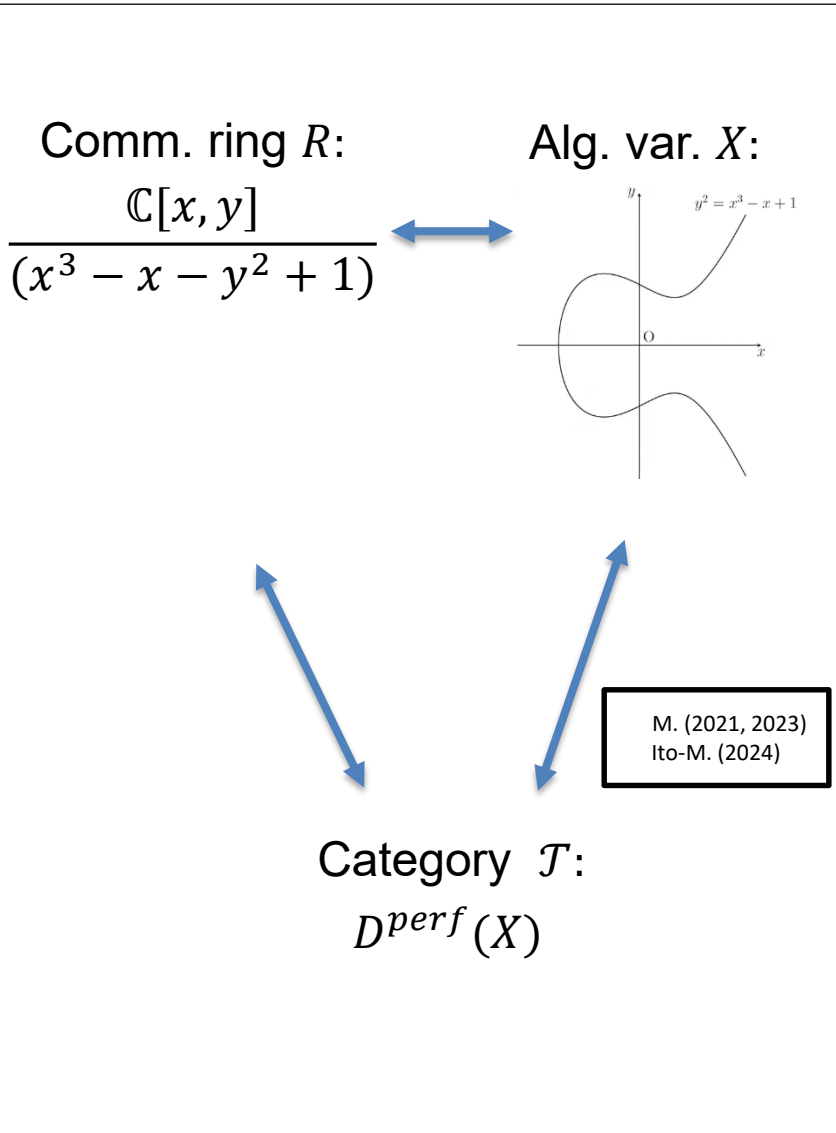




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# Derived categories of commutative rings / algebraic varieties

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Content:

A commutative ring is a set equipped with two commutative operations: addition and multiplication. Typical examples include the set of integers and the set of polynomials. This concept naturally appears in various fields and has developed through mutual interactions with areas such as number theory and algebraic geometry. For example, commutative rings can be regarded as a local model of algebraic varieties.

Commutative rings and algebraic varieties are nonlinear and hence difficult objects. On the other hand, **modules** are linear and hence easier than nonlinear object as we can do linear algebra. Therefore, it is tcommon to study commutative rings and algebraic varieties through he **category** of modules associated with them.

My recent research explores the idea of constructing **ringed spaces** from categories and recovering information about the original commutative ring or algebraic variety through their properties (Problem (b)). This approach has led to new results and provided unified alternative proofs for various known theorems.

Keywords: commutative ring, algebraic variety, category

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