

Perfectoid Cohen-Macaulay rings and homological aspects of commutative algebra in mixed characteristic

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The homological turn in commutative algebra due to Auslander and Serre was pushed forward by Peskine and Szpiro with a systematic use of the Frobenius functor, which led to tight closure theory, a powerful instrument developed by Hochster and Huneke to study singularities in characteristic p . We shall report on recent advances in the mixed characteristic case, where perfectoid Cohen-Macaulay algebras play the role of absolute integral closures in characteristic p , and lead to a mixed characteristic analog of tight closure theory.

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