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In this talk, I will survey recent developments in noncommutative geometry in positive and mixed characteristic. Explicitly, this involves the construction of invariants of noncommutative topological algebras over a field of positive characteristic, or the  $p$ -adic integers. These invariants, namely (bivariant) *local* and *analytic cyclic homology*, are appropriate modifications of (bivariant) periodic cyclic homology. They satisfy desirable formal properties such as homotopy invariance, matricial stability and excision, which make them computable for large classes of algebras such as smooth curves over finite fields and Leavitt path algebras. The universal functor that satisfies these properties is an analytic version of bivariant  $K$ -theory, analogous to Cuntz's bivariant  $K$ -theory for locally convex algebras, whose construction will be discussed.

*Trabajo en conjunto con Guillermo Cortiñas (Universidad de Buenos Aires, Argentina), Ralf Meyer (University of Göttingen, Germany).*

### **Referencias**

- [1] Ralf Meyer, Devarshi Mukherjee, Local cyclic homology for nonarchimedean Banach algebras, (accepted in Proceedings of Symposia in Pure Mathematics, American Mathematical Society)
- [2] Ralf Meyer, Devarshi Mukherjee, Analytic cyclic homology in positive characteristic, preprint (submitted), 2021
- [3] Guillermo Cortiñas, Ralf Meyer, Devarshi Mukherjee, Non-Archimedean analytic cyclic homology, Documenta Mathematica, 2020
- [4] Ralf Meyer, Devarshi Mukherjee, Dagger completions and bornological torsion-freeness, Quarterly Journal of Mathematics, 2019