The Frobenius functor for symmetric tensor categories in positive characteristic.

Abstract:

An important role in modular representation theory is played by the Frobenius twist functor, twisting the \( k \)-linear structure of a representation by the Frobenius automorphism \( F(a) = a^p \) of the (algebraically closed) ground field \( k \) of characteristic \( p \). I will define an analog of this functor for any symmetric tensor category of characteristic \( p \). One of the main new features is that unlike the classical Frobenius twist functor, this functor need not be left or right exact. I will give examples when it is not and describe a replacement of the exactness property. I will also describe applications of this notion to formulating and proving analogs of Deligne's theorem in positive characteristic. This is joint work with V. Ostrik.