

# QUANTUM SYMMETRIC ALGEBRAS

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ABSTRACT. A symmetric algebra on a vector space  $V$  is just a polynomial ring (in variables corresponding to a basis of  $V$ ). This is a commutative algebra, and may be defined by generators in  $V$ , and relations  $yx = xy$  for all  $x$  and  $y$  in  $V$ . In this talk, we will put this example in a much bigger context, generalizing these relations to those coming from a braiding on tensor powers of  $V$ . The resulting algebras are called quantum symmetric algebras, or Nichols algebras, or Nichols-Woronowicz algebras. They have appeared in many places, including quantum groups, the cohomology of flag manifolds, and the recent classification, by Andruskiewitsch and Schneider, of finite dimensional pointed Hopf algebras. We will define quantum symmetric algebras, survey some of their history, and discuss some of the newer examples and results.