The Ariki-Koike algebras are a class of finite dimensional algebras which rose to prominence because of their (conjectural) connections with the representations of the finite groups of Lie type (such as $GL_n(q)$). This talk will give a survey of the representation theory of these algebras, and the related cyclotomic Schur algebras, with an emphasis on the combinatorial techniques that have been used to study these algebras.