Steve Lack [*]

Macquarie University

Braided skew monoidal categories

Skew monoidal categories are generalizations of monoidal categories in which the associativity and unit maps are coherent but not necessarily invertible maps $a\colon (AB)C \to A(BC)$, $\ell\colon IA \to A$, and $r\colon A \to AI$. Examples have arisen in various fields, including quantum algebra (bialgebroids), 2-categorical algebra, and the theory of operads (operadic categories).

I will introduce the notion of a braiding on a skew monoidal category, whose curious feature is that the defining isomorphisms involve three objects rather than two. Examples are shown to arise from 2-categorical algebra and from quantum algebra. The 2-categorical examples can best be constructed using a notion of braided skew multicategory, and they in turn give rise to braided monoidal bicategories. As for the quantum algebraic examples, for a skew monoidal category arising from a bialgebra, braidings on the skew monoidal category are in bijection with cobraidings (also known as coquasitriangular structures) on the bialgebra.