Abstract: Chiral organoboronic esters are versatile intermediates for chemical synthesis. Not only are these compounds stable under a variety of reaction conditions, they are generally non-toxic and can be transformed with minimal generation of hazardous waste. An important feature of aliphatic organoboronic esters is that the boron atom may be replaced with an array of different functional groups through efficient, stereospecific transformations. This talk will present new strategies for the construction and transformations of chiral organoboronic esters, and will showcase how they may be used in organic synthesis.