Abstract algebraic logic

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At least since the time of George Boole, mathematicians have used algebraic structures to study logical systems, often those with a non-classical notion of implication. This process occurred in a relatively *ad hoc* manner until the theory of "abstract algebraic logic" emerged in the late 1980s. This theory provides an abstract framework within which one may establish equivalence between classes of algebraic systems and logical "consequence relations."

We will introduce the basic concepts of universal algebra and consequence relations necessary to understand the central theorems of abstract algebraic logic. We also cover some consequences of these theorems, including the algebraic equivalents of logical properties such as possession of a detachment-deduction theorem. In the process, we will look at some important examples of non-classical logics.