1098-68-150 **Matthew J Patitz*** (patitz@uark.edu), 517 JBHT, 1 University of Arkansas, Fayetteville, AR 72701. *An Introduction to Algorithmic Self-Assembly Within the Abstract Tile Assembly Model.*

Self-assembly is the process by which large collections of small, relatively simple components spontaneously and autonomously combine to form complex structures. The process of self-assembly is ubiquitous in nature, occurring across scales and domains, and drives the formation of everything from cellular components in living systems, to snowflakes and star systems. The abstract Tile Assembly Model (aTAM) introduced by Erik Winfree in 1998 has proven to be an elegant and powerful model of self-assembling systems, and has inspired laboratory implementations based on DNA molecules as well as many lines of mathematical research. In the aTAM, the fundamental components are square "tiles" with labeled "glues" on their edges which allow tiles to bind to each other along edges with matching glues. We will present the aTAM and survey a wide series of results within it, including: upper and lower bounds for the efficient algorithmic self-assembly of shapes, Turing universal computation by self-assembling systems, the self-assembly of self-similar fractal patterns, and the notion of intrinsic universality of the aTAM. We will also briefly discuss some new research directions and outstanding open problems in the field. (Received January 22, 2014)