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Gheorghe Craciun* (craciun@math.wisc.edu). *A proof of the Global Attractor Conjecture.*

In a groundbreaking 1972 paper Fritz Horn and Roy Jackson showed that a complex balanced mass-action system must have a unique locally stable equilibrium within any compatibility class. In 1974 Horn conjectured that this equilibrium is a global attractor, i.e., all solutions in the same compatibility class must converge to this equilibrium. Later, this claim was called the Global Attractor Conjecture, and it was shown that it has remarkable implications for the dynamics of large classes of polynomial and power-law dynamical systems, even if they are not derived from mass-action kinetics. Several special cases of this conjecture have been proved during the last decade. We describe a proof of the conjecture in full generality. In particular, it will follow that all detailed balanced mass action systems and all deficiency zero mass-action systems have the global attractor property. We will also discuss a generalization of this conjecture, called the Persistence Conjecture, and some implications for biochemical mechanisms that implement noise filtering and cellular homeostasis. (Received August 10, 2015)