1077-VK-2700   **Calistus Ngeh Ngonghala*** (`cnngonghala@nimbios.org`), NIMBioS, 1534 White Ave., Suite 400, University of Tennessee, Knoxville, TN 37996-1527. *Extreme multi-stability in a chemical model system.*

Coupled systems can exhibit an unusual kind of multi-stability, namely, the coexistence of infinitely many attractors for a given set of parameters. This extreme multi-stability is demonstrated to occur in coupled chemical model systems with various types of coupling. We show that the appearance of extreme multi-stability is associated with the emergence of a conserved quantity in the long-term limit. This conserved quantity leads to a "slicing" of the state space into manifolds corresponding to the value of the conserved quantity. The state space "slices" develop as $t \to \infty$ and there exists at least one attractor in each of them. We discuss the dependence of extreme multi-stability on the coupling and on the mismatch of parameters of the coupled systems. (Received September 22, 2011)