1040-13-107 **Craciun Gheorghe** and **Alicia Dickenstein*** (alidick@dm.uba.ar), Dto. de Matematica, FCEN, UBA, Ciudad Universitaria, Pab, I, 1428 Buenos Aires, Argentina, and **Anne Shiu** and **Bernd Sturmfels**. *Toric dynamical systems.*

Toric dynamical systems are mass action kynetics systems for which the steady state locus is a (deformed) toric variety, which has a unique point within each invariant polyhedron. They are known as complex balancing mass action systems in the mathematical chemistry literature, where many of their remarkable properties have been established. They have a wide range of applications in physics, in theoretical computer science and also in biology.

We develop the basic theory of toric dynamical systems in the context of computational algebraic geometry and show that the associated moduli space is also a toric variety. It is conjectured that the complex balancing state is a global attractor. This conjecture is open even for deficiency zero systems (for which the moduli ideal is zero). We prove this for detailed balancing systems whose invariant polyhedron is two-dimensional and bounded. (Received January 28, 2008)