1048-18-87 **Alissa S. Crans*** (acrans@lmu.edu), Loyola Marymount University, Department of Mathematics, One LMU Drive, Suite 2700, Los Angeles, CA 90045. *L-infinity algebras and Lie 2-algebras.*

A 'Lie 2-algebra' is a categorified version of a Lie algebra where the Jacobi identity holds up to a natural isomorphism called the 'Jacobiator', which in turn must satisfy a certain law of its own. This law is closely related to the Zamolodchikov Tetrahedron Equation, which is the higher-dimensional analogue of the Yang-Baxter Equation, or third Reidemeister move. The tetrahedron equation plays a role in the theory of knotted surfaces in 4-space which is closely analogous to that played by the third Reidemeister move in the theory of ordinary knots in 3-space. We show that just as any Lie algebra gives a solution of the Yang-Baxter equation, any Lie 2-algebra gives a solution of the Zamolodchikov tetrahedron equation. In addition, construct a 2-category of Lie 2-algebras and show that it is 2-equivalent to the 2-category of '2-term L-infinity algebras'. Finally, we classify Lie 2-algebras in terms of third cohomology classes in Lie algebra cohomology. This classification allows us to construct for any finite-dimensional Lie algebra $\mathfrak{g}$ a 1-parameter family of Lie 2-algebras, $\mathfrak{g}_k$. (Received January 27, 2009)