1014-57-337 **Mihai D Staic*** (mdstaic@buffalo.edu), Department of Mathematics, SUNY at Buffalo, Amherst, NY 14260. *Strong 3-algebras and a 2-group associated to manifolds.*

A 3-algebra is a vector space A together with three maps $m : A\otimes A\otimes A \to A$, $\overline{m} : A\otimes A \to A\otimes A$ and $P : A \to A$ which satisfy certain compatibilities. Geometrically m represents the projection of three faces of a 3 tetrahedron to the fourth face, $\overline{m}$ is the projection from two faces of a tetrahedron to the other two and P in the rotation of a face with an angle of $\frac{2\pi}{3}$. It was shown by Lawrence that Turaev-Viro invariants fits naturally in the context of 3-algebras.

In this talk we define strong 3-algebras. These are some particular types of 3-algebras, with $\overline{m}(a\otimes b) = m\otimes id(a\otimes b\otimes u(1))$ where $u : k \to A\otimes A$ is a linear map. The advantage of working with strong 3-algebras is that the relations among P, u and m are simpler. Moreover all examples we know are strong 3-algebras. Also, we show how the setting of 3 algebras leads to the construction of a 2-group which generalize the fundamental group $\pi_1(M)$. The idea is to replace the paths between based points with 2-paths between "based curves" (in other words, equivalence classes of maps from a 2-simplex to M which restricted to boundary are certain fixed curves). (Received September 10, 2005)