Meeting: 1003, Atlanta, Georgia, AMS CP 1, AMS Contributed Paper Session

1003-46-1482 **Patricia M. Garmirian*** (garmir_p@denison.edu), Slayter Box #1165, Denison University, Granville, OH 43023. *Encoding Algebra as Affine Geometry.* Preliminary report.

In our research, we imposed geometric axioms on a Banach space to obtain algebraic results. While quantum mechanical models are best described geometrically, the computational structures associated with these models are most often algebraic. The geometric property of facial linear complementation (denoted FLC) is the most general condition of a linear space needed to obtain an algebraic structure. A Banach space Z satisfies this property if the orthogonal complement of every norm exposed face is a linear subspace. For an algebra A, an element x is said to be an idempotent (respectively, tripotent) if $x = x^2$ ($x = x^3$). It is well known that, for a W*-algebra or JBW*-triple, the property of being a self-adjoint idempotent or tripotent can be encoded completely geometrically. It is also well-known that there exists a bijection between tripotents and norm closed faces of the unit ball of the predual.

In our paper, assuming FLC as our main axiom, we defined a notion of geometric tripotent and proved a bijection between faces of the unit ball of Z and tripotents of Z*. Secondly, we proved a spectral theorem which shows that any element in such a space can be decomposed as a linear combination of orthogonal geometric tripotents. In this talk, I will discuss these and other results. (Received October 05, 2004)