

1012-57-163

Kevin Iga* (kiga@pepperdine.edu), Pepperdine University, Natural Science Division, 24255 Pacific Coast Hwy., Malibu, CA 91302. *The topology of Adinkra diagrams*. Preliminary report.

Adinkras are diagrams invented in 2004 by physicists M. Faux and S. J. Gates intended to describe supersymmetric theories in $d = 1$ dimensions. They are directed graphs whose vertices correspond to the fields in the theory, and whose directed edges describe the various supersymmetries between these fields.

Higher dimensional cells also exist implicitly, but are not usually drawn. These cells, put together, form a complex whose geometric realization is a fairly well-behaved topological space. Many such topological spaces are known and can be constructed explicitly, including the ones that correspond to supersymmetry with no central charge.

The key mathematical framework for describing certain physically interesting features in an Adinkra is cubical cohomology, a notion of the cohomology of the underlying topological space, analogous to simplicial cohomology but with cubes instead of simplices. In addition, the language of cubical cohomology aids in the proof of some important foundational results about Adinkras. (Received September 19, 2005)