

1116-16-2201      **David C Meyer\*** ([meyerdc@missouri.edu](mailto:meyerdc@missouri.edu)), Department of Mathematics, University of Missouri, Columbia, MO 65201, and **Miodrag Iovanov**, **Gerard Koffi** and **Alex Sistko**. *Incidence-like algebras*. Preliminary report.

The representation theory of incidence algebras has been widely studied. Recently, modules for incidence algebras have been used in persistent homology in topological data analysis. In this talk, we discuss connections between incidence algebras and faithful distributive modules. If  $(P, \leq)$  is a finite poset, the incidence algebra over a field  $K$  can be interpreted as the trivial element of the cohomology group  $H^2(P, K^*)$ . Moreover,  $H^1(P, K^*)$  corresponds to isomorphism classes of faithful distributive modules for the incidence algebra. We demonstrate that under suitable hypotheses the existence of faithful distributive modules, in fact, characterizes incidence algebras. We then discuss generalizations of incidence algebras suggested by this characterization, and their connections to the cohomology of the poset. (Received September 22, 2015)