

## Colloquium

### Art Duval

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Friday, April 24, 2015 at 3pm in Bell Hall 143

#### A Non-Partitionable Cohen-Macaulay Simplicial Complex

Cohen-Macaulay simplicial complexes are ubiquitous in algebraic and topological combinatorics. In 1979, Richard Stanley posed the following conjecture about them, which he later described as “a central combinatorial conjecture on Cohen-Macaulay complexes”:

Conjecture: Every Cohen-Macaulay simplicial complex is partitionable.

We disprove this conjecture by constructing an explicit counterexample in three dimensions. Due to a result of Herzog, Jahan and Yassemi, our construction also disproves the conjecture, of great interest in commutative algebra, that the Stanley depth of a monomial ideal is always at least its depth.

This talk will be accessible to a wide audience, including students. Expect lots of models and pictures.

This is joint work with Bennet Goeckner, Carly Klivans, and Jeremy Martin