# A non-partitionable Cohen-Macaulay simplicial complex

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**Abstract**

A long-standing conjecture of Stanley states that every Cohen-Macaulay simplicial complex is partitionable. We disprove the conjecture by constructing an explicit counterexample in three dimensions. Due to a result of Herzog, Jahan and Yassemi, our construction also disproves the conjecture that the Stanley depth of a monomial ideal is always at least its depth.

Joint work with Bennet Goeckner, Carly Klivans, and Jeremy Martin.