1046-55-279   **David Pengelley*** (`davidp@nmsu.edu`), Mathematical Sciences, MSC 3MB, New Mexico State University, Las Cruces, NM 88003, and **Frank Williams** (`frank@nmsu.edu`), Mathematical Sciences, MSC 3MB, New Mexico State University, Las Cruces, NM 88003. *Unstable module presentations for the cohomology of real projective spaces.*

There is much we still do not know about projective spaces. We describe here how the cohomology of each real projective space is built as an unstable module over the mod two Steenrod algebra $\mathcal{A}$, or equivalently, over $\mathcal{K}$, the algebra of inherently unstable "lower operations" originally introduced by Steenrod. In particular, to produce the cohomology of projective space of each dimension we consider the well-known minimal set of unstable module generators and construct a minimal set of unstable relations. Two new perspectives we blend for this purpose are

- to focus solely on the two-power Steenrod squares that generate $\mathcal{A}$ to understand the $\mathcal{A}$-action in a process we call "shoveling ones", and.

- to describe every element in a canonical way from a particular unstable generator by composing operations from the algebra $\mathcal{K}$

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