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Jim Fowler* (fowler@math.osu.edu) and **Zhixu Su** (zhixus@uci.edu). *Manifolds realizing rational homotopy types.*

Computing coefficients of the Hirzebruch L -polynomials can be slow. A recursive method is quick enough to find many coefficients for our particular application: by solving certain Diophantine equations with these coefficients, we produce manifolds having a truncated polynomial algebra as their rational cohomology ring. Such manifolds may exist even when the corresponding truncated polynomial over \mathbb{Z} is not the cohomology ring of any space. As a specific example, there is a manifold having the rational cohomology that $\mathbb{O}P^4$ would be expected to have, if it existed. (Received September 04, 2012)