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Using the spherical trip theorem, we present a new intrinsic proof of Gromoll-Grove diameter rigidity theorem: “If a simply-connected Riemannian manifold has sectional curvature ≥ 1 and diameter $\frac{\pi}{2}$, then either it is homeomorphic to a sphere, or it is isometric to one of classic projective spaces.” This is a joint work with Jianguo Cao. (Received January 25, 2008)