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William Ballinger* (whb5@math.princeton.edu). *Configurations of spheres in $\#^n\mathbb{C}P^2$ and small four-manifolds with lens space boundary.*

By taking the complements of embeddings of sphere plumbings in connected sums of $\mathbb{C}P^2$, we construct examples of simply connected four-manifolds with lens space boundary and $b_2 = 1$. The resulting boundaries include many lens spaces that cannot come from integer surgery on any knot in S^3 , so the corresponding four-manifolds cannot be built by attaching a single two-handle to B^4 . Using versions of this construction, we also investigate which homology classes in $\#^n\mathbb{C}P^2$ can be represented by smoothly embedded spheres, arriving at a precise conjecture for when this is possible. (Received January 05, 2022)