SMALL EXOTIC 4-MANIFOLDS

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In the past few years a lot of interest has been gathered around constructing smooth 4-manifolds which are homeomorphic but not diffeomorphic to the projective plane blown-up at n points (for $n < 10$), as well as to the connected sum of three copies of the projective plane blown-up at m points (for $m < 20$). These manifolds are "small" in the sense that they have small euler characteristics (while all being simply-connected), whereas the construction of exotic smooth structures gets harder when the manifolds are smaller. Nevertheless, relying on the novel advance in the last decade, where the effects of various topological operations on the smooth invariants (namely Seiberg-Witten) were understood, smooth 4-manifold topologists managed to take these numbers gradually down to $n = 3$ and $m = 5$. In this talk, I will describe a general strategy to obtain several of these exotic 4-manifolds, and then outline how to construct infinitely many exotic structures on them.