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**Rational blow-down and small exotic 4-manifolds**

*Abstract:* It is known that most simply connected 4-manifolds admit infinitely many “exotic” smooth structures, but the existence of such structures is still unknown for  $S^4$  and  $CP^2$ . We report on the current state of the art of exotic structures on rational surfaces, and review how such structures can be constructed. The main ingredients are the rational blow-down process and the computation of appropriate Seiberg-Witten invariants. We also discuss the classification of plumbing trees which can be symplectically blown down.