Symplectic blowups of the complex projective plane,and counting torus actions.

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Abstract:
In how many different ways can a two-torus act on a given simply connected symplectic four-manifold?
If the second Betti number is one or two, this was known. For a higher Betti number, our ("soft") proof that there are only finitely many inequivalent torus actions did not enable us to count these actions.
I will report on recent work, in which we reduce this counting question to combinatorics, by expressing the manifold as a symplectic blowup in a way that is compatible with all the torus actions simultaneously. For this we use the theory of pseudoholomorphic curves.
This work is joint with Liat Kessler and Martin Pinsonnault.