Integral cohomology ring of 4-dimensional toric orbifolds

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It is well-known that the rational cohomology ring of a toric variety with orbifold singularities behaves similarly to the integral cohomology ring of smooth toric varieties. What has been known for the integral cohomology ring of an arbitrary toric variety is somewhat restrictive and complicated for computational purposes. In this talk, we consider toric surfaces, namely the toric varieties of complex dimension 2. The main result determines the integral cohomology ring structure of toric surfaces (and arbitrary 4-dimensional toric orbifolds in general) in terms of a "basis" and "relations". This is a joint work with Xin Fu (BIMSA) and Tseleung So (Western University).