

THE HILBERT SCHEME OF POINTS ON SINGULAR SURFACES

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Abstract: The Hilbert scheme of points on a quasi-projective variety parametrizes its zero-dimensional subschemes. When the variety is a singular surface, the geometry of the Hilbert scheme should reflect the singularity of the underlying surface. I will present a sufficient condition for the Hilbert scheme to be irreducible in terms of the singularity of the surface, namely, the surface has only Kleinian singularities, via a purely algebraic approach. I will also report work in progress on some geometric consequences following their irreducibility.