1153-14-423 **Ronno Das*** (ronnodas@gmail.com). *Points and lines on cubic surfaces.*

The Cayley-Salmon theorem states that every smooth cubic surface in $\mathbb{C}P^3$ has exactly 27 lines. Their proof is that marking a line on each cubic surface produces a 27-sheeted cover of the moduli space M of smooth cubic surfaces. Similarly, marking a point produces a 'universal family' of cubic surfaces over M. One difficulty in understanding these spaces is that they are complements of incredibly singular hypersurfaces. In this talk I will explain how to compute the rational cohomology of these spaces. I'll also explain how these purely topological theorems have (via the machinery of the Weil Conjectures) purely arithmetic consequences: the average smooth cubic surface over a finite field $\mathbb{F}_q$ contains 1 line and $q^2 + q + 1$ points. (Received September 02, 2019)