

## SEMINARIO DI GEOMETRIA

28 Maggio 2014, h.15.00-16.00

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Surfaces with  $p_g = 0$ ,  $K^2 = 3$  and 5-torsion

There is (almost) no information available on the literature about complex algebraic surfaces of general type with geometric genus  $p_g = 0$ , self-intersection of the canonical divisor  $K^2 = 3$  and with 5-torsion.

If  $S$  is a quintic surface in  $\mathbb{P}^3$  having 15 3-divisible ordinary cusps as only singularities, then there is a Galois triple cover  $\phi : X \rightarrow S$  branched only at the cusps such that  $X$  is regular,  $p_g(X) = 4$ ,  $K_X^2 = 15$  and  $\phi$  is the canonical map of  $X$ . We use computer algebra to search for such quintics having a free action of  $\mathbb{Z}_5$ , so that  $X/\mathbb{Z}_5$  is a smooth minimal surface of general type with  $p_g = 0$  and  $K^2 = 3$ . We find two different examples, one of them is the Van der Geer-Zagier's quintic, the other is new.