



Department of Mathematics Seminar

Beauville p -groups

By

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Abstract: A *Beauville surface* of unmixed type is a compact complex surface which is the quotient of the product of two algebraic curves by a special action of a finite group. The groups that can appear in such a construction are called *Beauville groups*.

It is easy to give a purely group theoretical description of Beauville groups. Given a group G and two elements $x, y \in G$, let $\Sigma(x, y)$ be the union of all conjugates of $\langle x \rangle$, $\langle y \rangle$ and $\langle xy \rangle$. Then G is a Beauville group if and only if it is a 2-generator group having two systems of generators $\{x_1, y_1\}$ and $\{x_2, y_2\}$ such that $\Sigma(x_1, y_1) \cap \Sigma(x_2, y_2) = 1$. In this case, we say that $\{x_1, y_1\}$ and $\{x_2, y_2\}$ form a *Beauville structure* for G .

The question as to which finite groups are Beauville groups has received considerable attention in recent times. Catanese showed in 2000 that the abelian Beauville groups are those of the form $C_n \times C_n$ with $\gcd(n, 6) = 1$. In 2012, Guralnick and Malle proved that any non-abelian finite simple group other than A_5 is a Beauville group. On the other hand, the study of nilpotent Beauville groups can be reduced to that of Beauville p -groups.

In this talk, we extend the knowledge about Beauville p -groups. We will first extend Catanese's characterization of abelian Beauville groups to finite p -groups satisfying certain conditions which are much weaker than commutativity. Then we will give examples of infinite families of Beauville p -groups by working with finite quotients of infinite groups such as free groups, free products, Nottingham groups and GGS-groups. Finally, we will talk about asymptotic behavior of Beauville and non-Beauville p -groups.

Date: 2 August 2019, Friday

Time: 13:40

Place: SA141 Mathematics Seminar Room

* Tea and cookies will be served after the talk. All are most cordially invited.