

JOINT ADM - ALGEBRAIC GEOMETRY AND NUMBER THEORY SEMINAR

3:30 PM, Thursday, March 26, 2015, Martin M-102
Refreshments 3:00 PM, Martin O-section foyer

The mean number of 3-torsion elements in ray class groups of quadratic fields

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In 1971, Davenport and Heilbronn determined the mean number of 3-torsion elements in the class groups of quadratic fields, when ordered by discriminant. I will describe some aspects of the proof of Davenport and Heilbronn's theorem; in particular, they prove a relationship via class field theory between the number of 3-torsion ideal classes of quadratic fields and the number of *nowhere totally ramified* cubic fields over \mathbb{Q} . This argument generalizes to give a relationship between 3-torsion elements of the ray class groups of quadratic fields and certain pairs of cubic fields satisfying explicit ramification conditions. I will illustrate how the combination of this fact with Davenport-Heilbronn's asymptotics on the number of cubic fields of bounded discriminant allows one to compute the mean number of 3-torsion elements in ray class groups of quadratic fields. If time permits, I will discuss the analogous theorems computing the mean size of 2-torsion elements in ray class groups of cubic fields ordered by discriminant, generalizing Bhargava.

All welcome. Research students in particular are encouraged to attend.

For further information, contact Jim Brown, jimlb@g.clemson.edu, Long 111.

Online: http://people.clemson.edu/~spoznan/adm_seminar/