

On the Geometry of Log-Unit Lattices of Real Galois Number Fields

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One of the most fundamental results of classical algebraic number theory is Dirichlet's Unit Theorem. One proof, due to Minkowski, involves the construction of an Euclidean lattice which reads the rank of the unit group of the ring of integers. This lattice is called the Log-Unit Lattice, and it is the main protagonist of this talk. For the case of real Galois number fields, we are going to see what type of geometric properties these lattices can have. Can they be perfect? well-rounded? orthogonal? By using Eva Bayer's theory of Ideal Lattices, I will show you a natural parametrizing space where these lattices live and where these properties can be studied. If time permits, I will show you some pictures of examples of these parametrizing and how some known families of log unit lattices look in there. This is joint work with Fatemeh Jalalvand from the University of Calgary.

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