1096-05-757 **Relinde Jurrius*** (relinde.jurrius@vub.ac.be), Vrije Universiteit Brussel, Belgium, and **Ruud Pellikaan** (g.r.pellikaan@tue.nl), Eindhoven University of Technology, Netherlands.

Application of hyperplane arrangements to weight enumeration.

Many research in coding theory is focussed on linear error-correcting codes. Since these codes are subspaces, linear algebra plays a prominent role in studying them.

An important polynomial invariant of linear error-correcting codes is the (extended) weight enumerator. The weight enumerator gives information about the probability of undetected errors in error-detection, and about the probability of decoding errors in bounded distance decoding. Furthermore, the extended weight enumerator is equivalent to the Tutte polynomial of the matroid associated to the code.

Linear codes are closely connected to hyperplane arrangements: the columns of the generator matrix of a code can be viewed as the coordinates of a hyperplane arrangement over a finite field. Using this correspondence, the problem of determining the extended weight enumerator can be transformed into a counting problem on a hyperplane arrangement. In fact, the extended weight enumerator is equivalent to the coboundary polynomial (or two-variable characteristic polynomial) of the associated hyperplane arrangement.

In this talk, we will examine this application of hyperplane arrangements to weight enumeration in more detail. The practical use of the theory will be motivated by several examples. (Received September 10, 2013)