

# Combinatorial identities for subspaces and finite sets

*Geir Agnarsson*, George Mason University, Fairfax VA – 22030

## Abstract

In this talk we will discuss some combinatorial identities obtained by studying the lattice of subspaces of vector spaces over a finite field  $\mathbb{F}_q$ , henceforth called *q-identities*. Many of these identities are similar to corresponding identities for the Boolean lattice of finite sets. What is often more remarkable is the fact that taking the limit  $q \rightarrow 1$  of a *q-identity* often yields an identity on the Boolean lattice. – This systematic study of this analogy is due to Goldman and Rota from 1970. A canonical explanation as to why so often Boolean identities emerge when  $q \rightarrow 1$  is still at large.

**Keywords:**