



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON PURE MATHEMATICS

**Largest intersections of degree d
hypersurfaces in projective space**

by

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Abstract

Given r hypersurfaces in projective space \mathbf{P}^m of degree d , one can ask for the maximum number of \mathbf{F}_q -rational points in their intersection. This turns out to be equivalent to computing the r -th generalized Hamming weight of the projective Reed–Muller code $\mathbf{PRM}_q(d, m)$. Beelen, Datta and Ghorpade conjectured an exact formula, and I will explain our progress on this problem. We show that the conjecture holds for sufficiently large q , with an explicit bound depending on (m, d, r) , and also prove the conjecture when $m = 2$. I will also discuss our new conjecture for a variant where the intersection is required to be zero-dimensional.

Date : 24 September 2025 (Wednesday)

Time : 3:00p.m.- 4:00p.m.

Venue : Room 3598 (Lift 27 & 28)

All are Welcome!