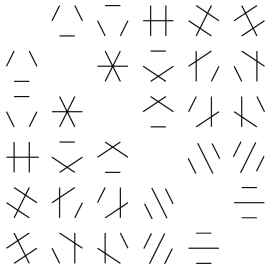
Mathematics Seminar



Rocky Mountain Algebraic Combinatorics Seminar

Mathematics of 3D Printing

Alexander Hulpke
Colorado State University

3D printing is a new manufacturing technology that produces an object from scratch without having to remove undesired surrounding material. Since it specifies objects by their coordinates it is eminently suitable for constructing mathematical models. I will describe scope and limitations of the technology for this purpose and give ample examples.

A new family of Cameron–Liebler line classes

Morgan Rodgers
Los Medanos College

Cameron-Liebler line classes are sets of lines in $\mathrm{PG}(3,q)$ having many nice combinatorial properties; they were originally studied as generalizations of symmetric tactical decompositions of $PG(3,q)$, as well as of orbits of subgroups of $\mathrm{P\Gamma L}(4,q)$ having equally many orbits on points and lines. Under the Klein correspondence, Cameron?Liebler line classes of $\mathrm{PG}(3,q)$ correspond to tight sets in the hyperbolic quadric $\mathcal{Q}^+(5,q)$.

Many new examples of Cameron?Liebler line classes found by computer search were described in recent work, here we detail results proving the existence of a new infinite family of examples in $\mathrm{PG}(3,q)$ having parameter $\frac{q^2-1}{2}$ for all$q \equiv 5$ or $9 \mod 12$. When $q \equiv 9 \mod 12$, these examples occur as line classes in symmetric tactical decompositions of $\mathrm{PG}(3,q)$ having four classes on points and lines. In this situation we have $q = 3^{2e}$ positive integer e. The nature of these decompositions allows us to also prove the existence of sets of type $\left(\frac{1}{2}(3^{2e}-3^e), \frac{1}{2}(3^{2e}+3^e)\right)$

Weber 223
4–6 pm
Friday, February 6, 2015
(Refreshments in Weber 117, 3:30–4 pm)
Colorado State University

This is a joint Denver U / UC Boulder / UC Denver / U of Wyoming / CSU seminar that meets biweekly.
Anyone interested is welcome to join us at a local restaurant for dinner after the talks.

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