Jaap Seidel's Network

Willem H Haemers

Tilburg University

The Netherlands

J.J. Seidel 1919-2001

Mathematics

Edited by A. Dold and B. Eckmann

558

Boris Weisfeiler

On Construction and Identification of Graphs

Springer-Verlag
Berlin · Heidelberg · New York

Acknowledgement

I am greatly indebted to Professor J. J. Seidel. His interest in the problems discussed in this volume encouraged me and his criticism, both mathematical and linguistical, helped to make the manuscript better. I am also grateful to Professor D. G. Corneil, who sent me many preprints of his work, and to J. Hager for linguistical corrections. It is a pleasure to thank here C. D. Underwood, the Administrative Officer of the School of Mathematics, I.A.S., for her patience and help during my stay at the Institute, and the Secretaries, I. C. Abagnale, A. W. Becker, E. T. Laurent, and M. M. Murray for their excellent typing. I am also grateful to the Institute for Advanced Study for support during my stay there.

B. Weisfeiler

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The department

Who are we?

- Founded in 1957; Computer Science since 1981
- 3,000 Masters of Science
- 600 Professional Doctorates in Engineering
- 500 PhD theses
- 12,000 scientific publications

Where do we come from?

Edsger Dijkstra
(1930-2002)

ALGOL, Turing Award in 1972

Jack van Lint
(1932 – 2004)

Discrete mathematics and coding theory

Jaap Seidel
(1919 – 2001)

Founding Father

Dick de Bruijn
(1918 – 2012)

De Bruijn Sequences, Automath

The Department of Mathematics and Computer Science is one of the nine departments of the Eindhoven University of Technology

Jack van Lint

EQUILATERAL POINT SETS IN ELLIPTIC GEOMETRY

BY

J. H. VAN LINT AND J. J. SEIDEL

(Communicated by Prof. C. J. BOUWKAMP at the meeting of December 18, 1965)

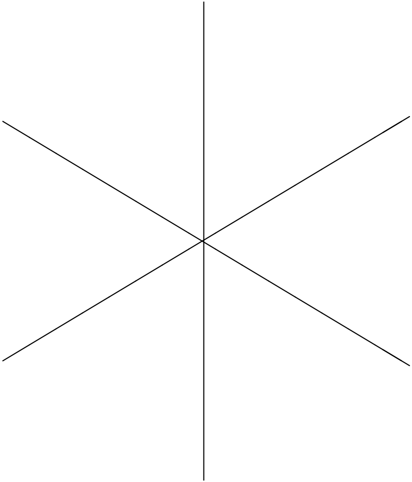
1. *Introduction on geometry*

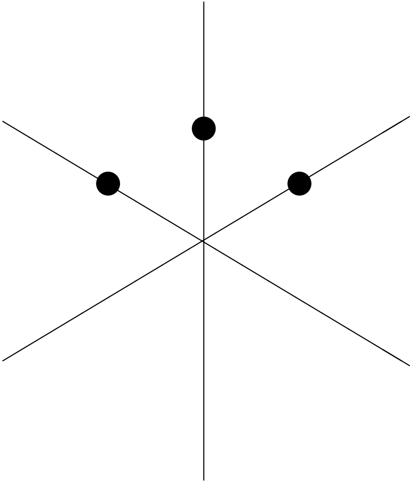
Elliptic space of $r-1$ dimensions E_{r-1} is obtained from r-dimensional vector space R_r with inner product (a, b) as follows. For $1 \leqslant k \leqslant r$, call any k-dimensional linear subspace R_k of R_r a $(k-1)$-dimensional elliptic subspace E_{k-1}, and, for any pair of elliptic points $E_0 : x = \lambda a$ and $E_0' : x = \mu b$, define the elliptic distance $\delta(E_0, E_0')$ by

$$\cos \delta(E_0, E_0') = \frac{|(a, b)|}{\sqrt{(a, a)\,(b, b)}}, \qquad 0 \leqslant \delta \leqslant \tfrac{1}{2}\pi,$$

which, by taking $|a| = |b| = 1$, reduces to

$$\varepsilon \cos \delta(E_0, E_0') = (a, b),\ \varepsilon = \pm 1, \qquad 0 \leqslant \delta \leqslant \tfrac{1}{2}\pi.$$





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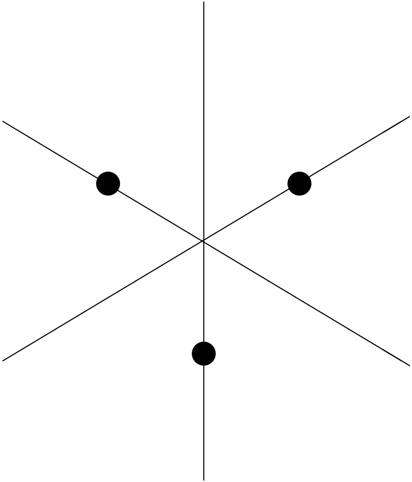


$$\begin{bmatrix} & - & - \\ - & & - \\ - & - & \end{bmatrix}$$

Jaap Seidel and Don Higman

Line Graphs, Root Systems, and Elliptic Geometry

P. J. Cameron*

Bedford College, London, England

J. M. Goethals

M. B. L. E. Research Laboratory, Brussels, Belgium

J. J. Seidel

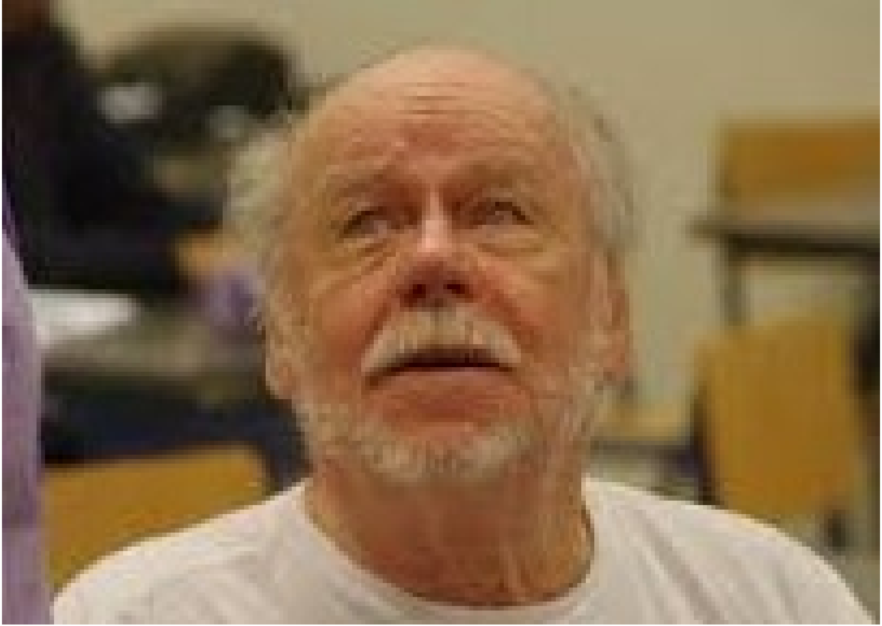
Technological University, Eindhoven, Netherlands

AND

E. E. Shult

Kansas State University, Manhattan, Kansas 66502, U.S.A.

Peter Cameron



Ernie Shult

Jean-Marie Goethals

Jean-Marie Goethals

SPHERICAL CODES AND DESIGNS

P. DELSARTE, J. M. GOETHALS AND J. J. SEIDEL

1. Introduction

A finite non-empty set X of unit vectors in Euclidean space $\mathbb{R}^d$ has several characteristics, such as the dimension $d(X)$ of the space spanned by X, its cardinality $n = |X|$, its degree $s(X)$ and its strength $t(X)$.

The *degree* $s(X)$ is the number of values assumed by the inner product between distinct vectors in X; that is,

$$s(X) = |A(X)|, \qquad A(X) = \{\langle \xi, \eta \rangle ; \xi \neq \eta \in X\}.$$

We shall consider sets X having the property that $A(X)$ is contained in a prescribed subset A of the interval $[-1, 1[$. Such sets are called *spherical A-codes*. We are interested in upper bounds for $n = |X|$, and in the structure of spherical A-codes which are extremal with respect to such bounds. For

Philippe Delsarte

AN ALGEBRAIC APPROACH TO THE ASSOCIATION SCHEMES OF CODING THEORY *)

BY

P. DELSARTE

*) Thesis, Université Catholique de Louvain, June 1973.
Promotor: Professor Dr J. M. Goethals.

Philips Res. Repts Suppl. 1973, No. 10.

Acknowledgment

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Guests of Jaap and Jack in the 70s

Ed Assmus, Dragoš Cvetković, Chris Godsil,
Jon Hall, Don Higman, Dan Hughes,
Rudi Mathon, Don Taylor, Rick Wilson.

Other weekly seminar participants in the 70s

Aart Blokhuis, Willem Haemers, Karel Post, Henk van Tilborg, Hennie Wilbrink,

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Frank De Clerck, Ruud Jeurissen, Cees Roos,
Lex Schrijver,
Edwin van Dam, Jack Koolen, René Peeters.

Belgium

Soviet Union

India

THEOREM (Seidel 1973?)
The switching class of the Paley graph of order q^2 extended with an isolated vertex contains a strongly regular graph with parameters

$$(q^2+1, \frac{q(q-1}{2}, \frac{(q+1)(q-3)}{4}, \frac{(q-1)^2}{4})$$

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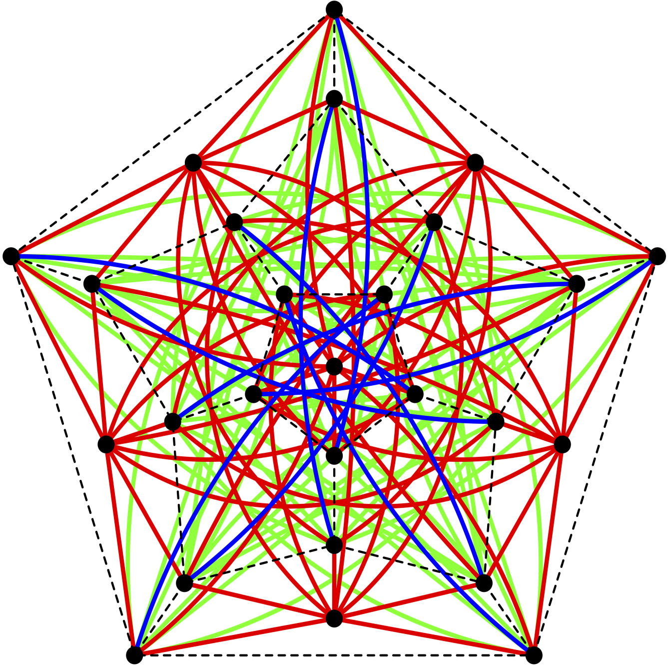
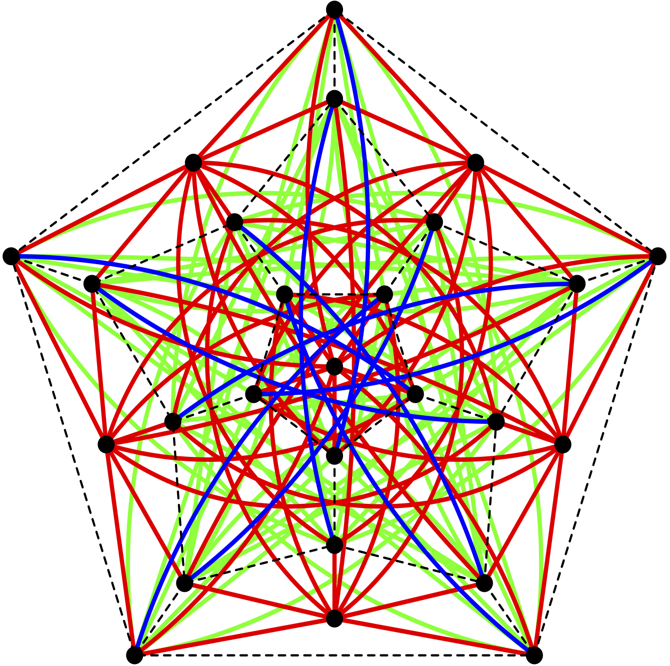
$q = 5$ gives:





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