# Systems of equiangular lines, Seidel matrices and adjacency matrices

Jack Koolen

*University of Science and Technology of China*

koolen@ustc.edu.cn

It is known that large systems of equiangular lines with common angle $\arccos 1/\alpha$ are closely related with Seidel matrices $S$ with smallest eigenvalue $-\alpha$ such that $S+\alpha I$ has low rank. In this talk I will introduce the notion of a switching root and show how we can use the switching root to relate adjacency matrices and Seidel matrices. If time permits I will also discuss some new maximal connected graphs with minimal eigenvalue $-3$, that is, any proper connected supergraph of such graph has smallest eigenvalue less than $-3$. This is based on joint work with Meng-Yue Cao (Beijing Normal University), Akihiro Munemasa (Tohoku University), Kiyoto Yoshino (Tohoku University) and Brhane Gebremichel (University of Science and Technology of China).